The PHOTOFACT® Servicer

SET 474 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ FEB., 1960

CONTENTS PHOTOFACT SET 474

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
PACKARD-BELL 17VT10, 21VC8, 21VT6 (Ch. V8-3)	474-1
TRUETONE 2DC3030A	474-2
PRODUCTION CHANGE BULLETIN	
MOTOROLA Television Rec. Y21K115BA, MA, WA, Y21K116BA, MA, MCA, WA, Y21T62MA, Y21T63BA, MA, WA, 21K99W, 21T57MO, 21T62MA (Ch. TS-551Y, WTS-551, Y)	474-3
SILVERTONE Television Rec. PC-161, PC-161-5, PC-163, PC-163-5, PC-165, PC-165-5, PC-181, PC-181-5, PC-183, PC-183-5, PC-185, PC-185-5, PC-187, PC-187-5, 161, 161-5, 163, 163-5, 165, 165-5, 181, 181-5, 183, 183-5, 185, 185-5, 187, 187-5 (Ch. 456.52200, 201, 202, 203, 240, 241, 300, 301, 528.52200, 201, 202, 203, 240, 241, 300, 301)	474-3
OTHER EQUIPMENT	
ADMIRAL 742, 743 (Ch. 7Q1)	474-4
ARVIN 5592, 5594 (Ch. 1.46800, 1.46900)	474-5
BELL SOUND 5650	474-6
COLUMBIA 623	474-7
GENERAL ELECTRIC AS4A	474-8
MOHAWK Tape Recorder 300, 400	474-9
OLYMPIC CONTINENTAL GB375	474-10
RIVERSIDE FJB-6686A, FJB-6689A	474-11
FJB-6690A	474-12
SILVERTONE 69, 70, 71 (Ch. 528.53560, .59440, .59460)	474-13
280, 281, 282 (Ch. 528.59410, 411, 420)	474-14
STEELMAN 2-2211, -1, 2-2221, -1, 2-6211, -1, 2-6221, -1	474-15
SYLVANIA SC05, SC08, 4315, 4318, 4321 (Ch. 1-633-1)	474-16
1304RE, TU, YE, 2305RE, TU, YE (Ch. 1-632-1, -2)	474-17
TRAV-LER 8080	474-18
TRUETONE DC5983A	474-19
WEBCOR 4901, 4903-1, -1A, 4904-1, -1A (Ch. 14X292-1, 296-1, 305-1)	474-20
ZENITH BPS-80C, DPS-80C	474-21

This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

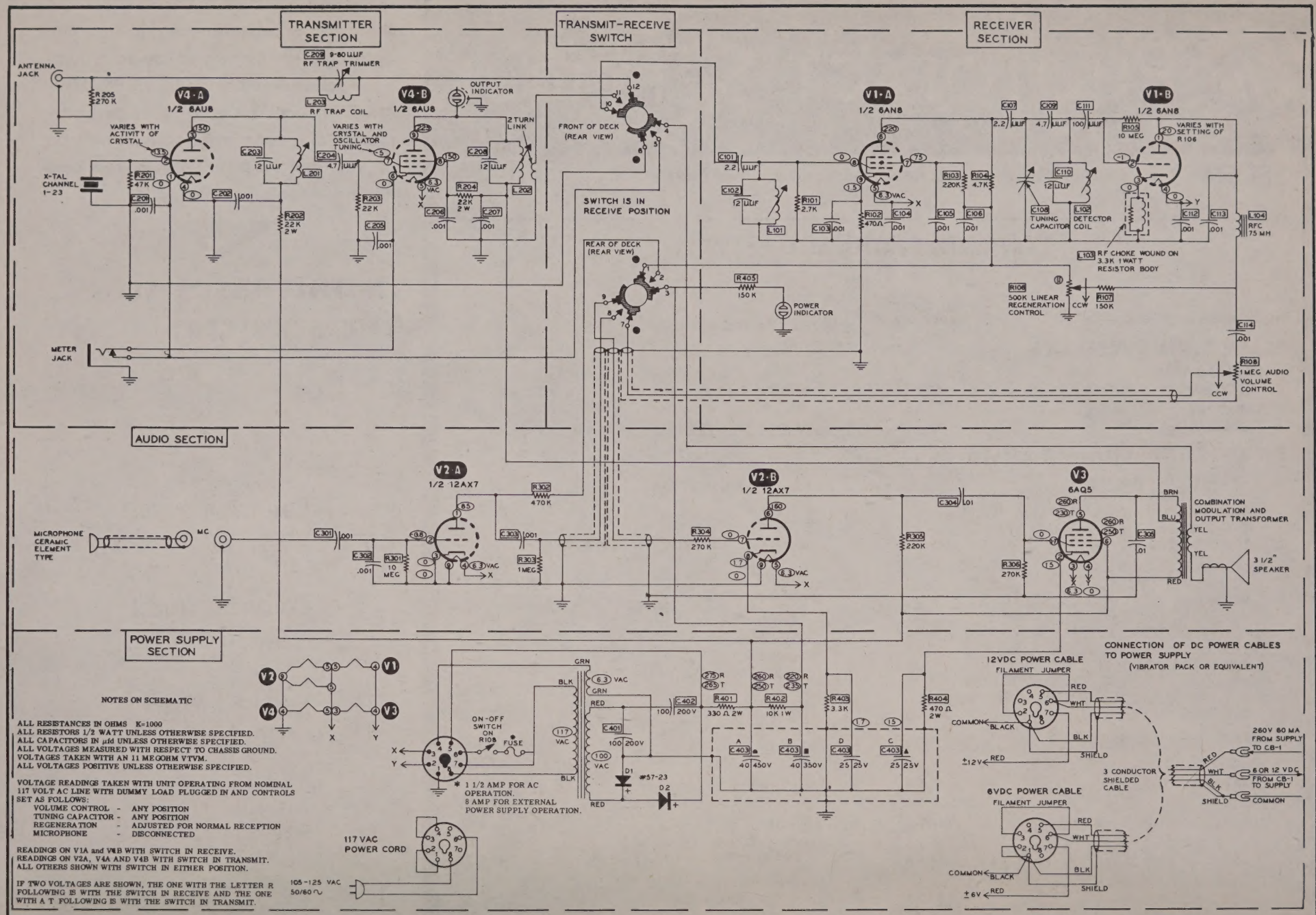
IN THIS ISSUE OF THE SERVICER:

Columbia Models 905, 907

Columbia Model 951

Heathkit Model CB-1

Knight Model Y-713



NOTES ON SCHEMATIC

ALL RESISTANCES IN OHMS K=1000
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
ALL CAPACITORS IN μfd UNLESS OTHERWISE SPECIFIED.
ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND.
VOLTAGES TAKEN WITH AN 11 MEGOHM VTVM.
ALL VOLTAGES POSITIVE UNLESS OTHERWISE SPECIFIED.

VOLTAGE READINGS TAKEN WITH UNIT OPERATING FROM NOMINAL 117 VOLT AC LINE WITH DUMMY LOAD PLUGGED IN AND CONTROLS SET AS FOLLOWS:

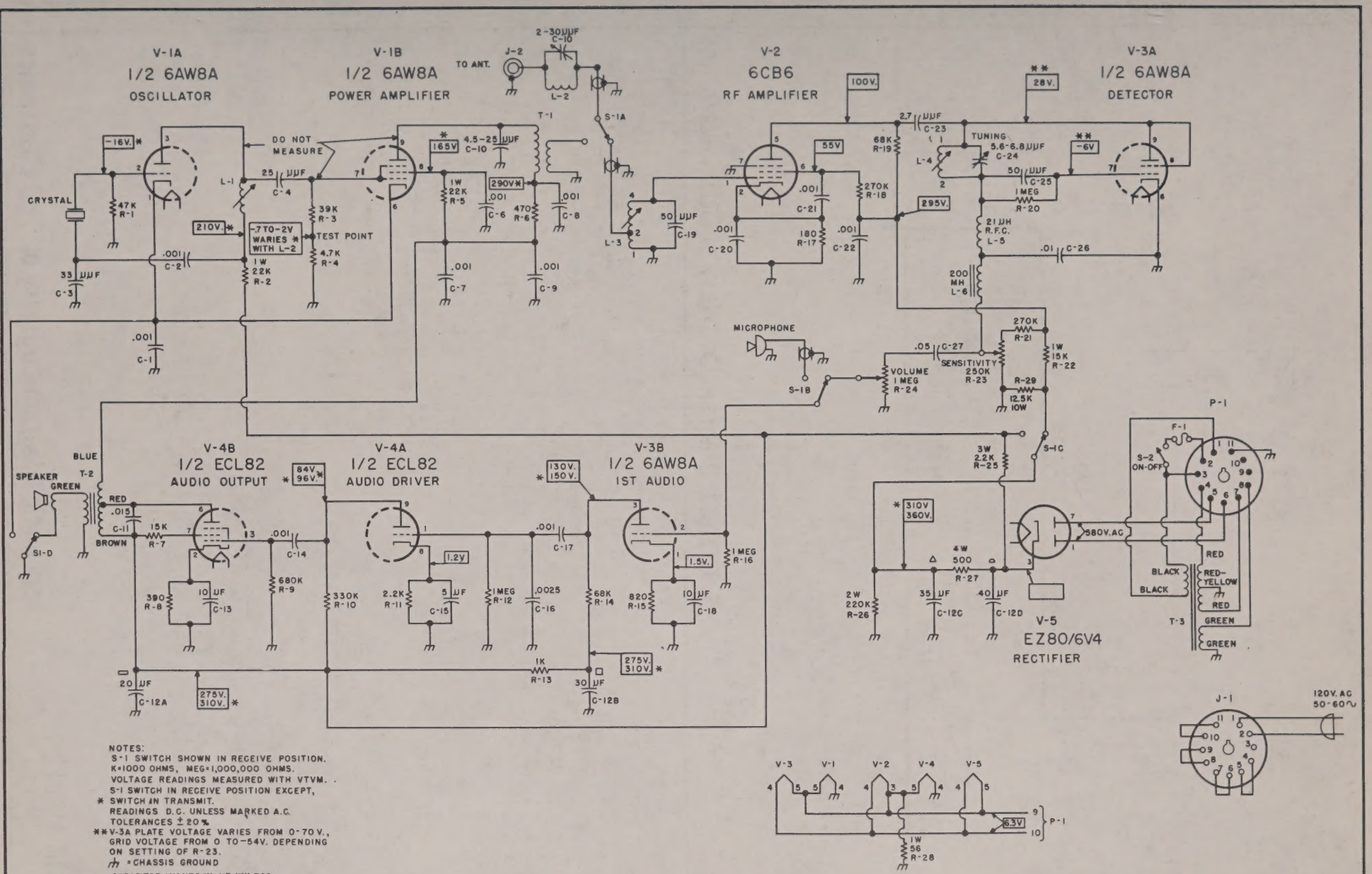
VOLUME CONTROL	-	ANY POSITION
TUNING CAPACITOR	-	ANY POSITION
REGENERATION	-	ADJUSTED FOR NORMAL RECEPTION
MICROPHONE	-	DISCONNECTED

READINGS ON V1A and V1B WITH SWITCH IN RECEIVE.
READINGS ON V2A, V4A AND V4B WITH SWITCH IN TRANSMIT.
ALL OTHERS SHOWN WITH SWITCH IN EITHER POSITION.

IF TWO VOLTAGES ARE SHOWN, THE ONE WITH THE LETTER R FOLLOWING IS WITH THE SWITCH IN RECEIVE AND THE ONE WITH A T FOLLOWING IS WITH THE SWITCH IN TRANSMIT.

HEATHKIT MODEL CB-1

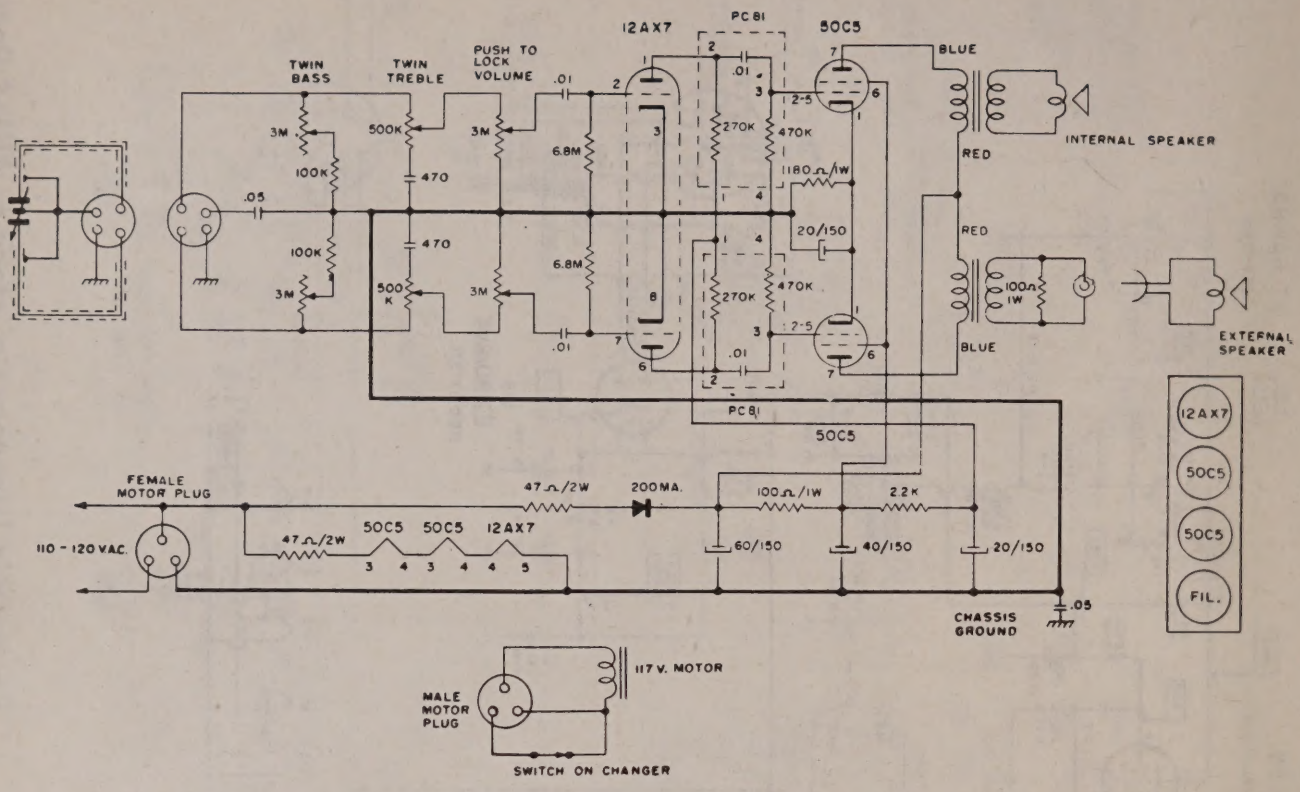
Schematic Diagram Courtesy of The Heath Company



NOTES:
S-1 SWITCH SHOWN IN RECEIVE POSITION.
K=1000 OHMS, MEG=1,000,000 OHMS.
VOLTAGE READINGS MEASURED WITH VTVM.
S-1 SWITCH IN RECEIVE POSITION EXCEPT,
* SWITCH IN TRANSMIT.
READINGS D.C. UNLESS MARKED A.C.
TOLERANCES ± 20%
** V-3A PLATE VOLTAGE VARIES FROM 0-70 V., GRID VOLTAGE FROM 0 TO -54V. DEPENDING ON SETTING OF R-23.
⏚ = CHASSIS GROUND
CAPACITOR VALUES IN UF, UNLESS OTHERWISE SPECIFIED

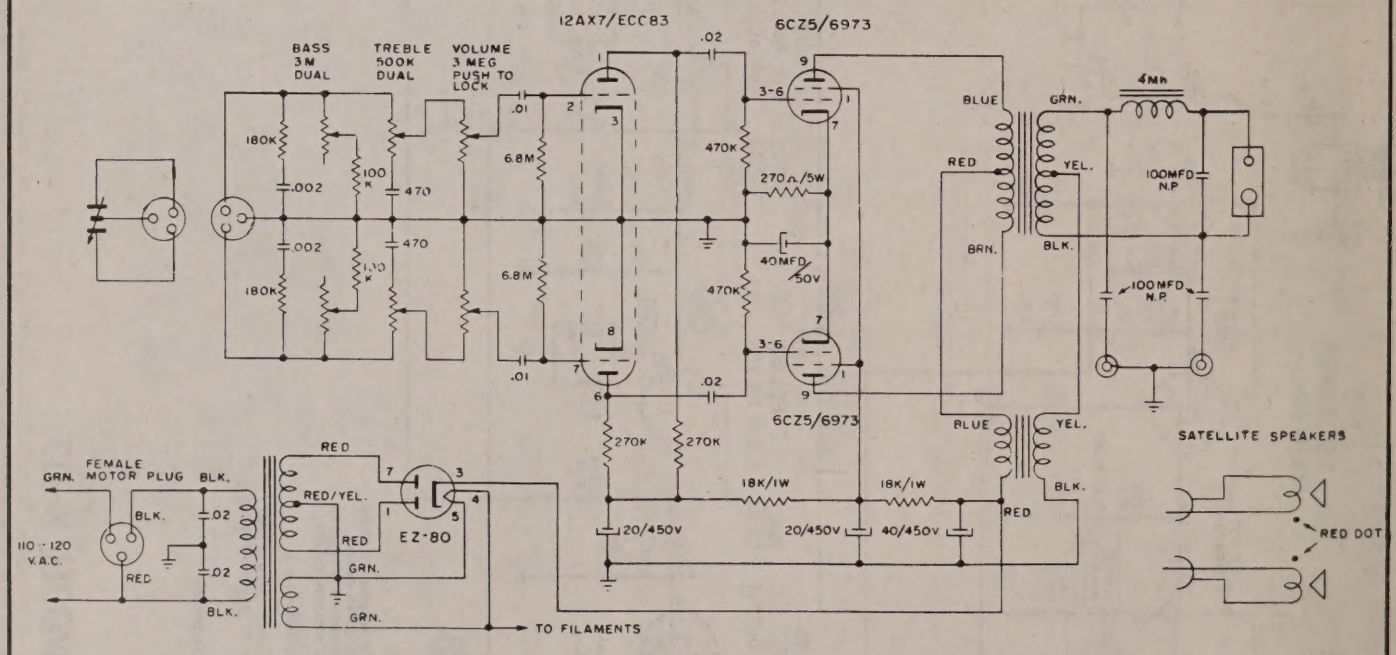
KNIGHT MODEL Y-713

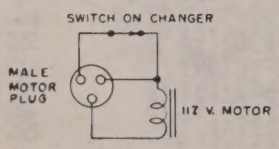
Schematic Diagram Courtesy of Allied Radio

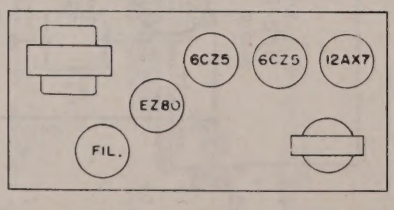


COLUMBIA MODELS 905, 907

Schematic Diagram Courtesy of CBS Electronics







COLUMBIA MODEL 951

Schematic Diagram Courtesy of CBS Electronics

PHOTOFACT® Folder

PACKARD-BELL MODELS 17VT10, 21VC8, 21VT6 (Ch. V8-3)

PACKARD-BELL MODELS 17VT10, 21VC8, 21VT6 (Ch. V8-3)

PACKARD-BELL MODELS 17VT10, 21VC8, 21VT6 (Ch. V8-3)

MODEL 21VC8 (Ch. V8-3)

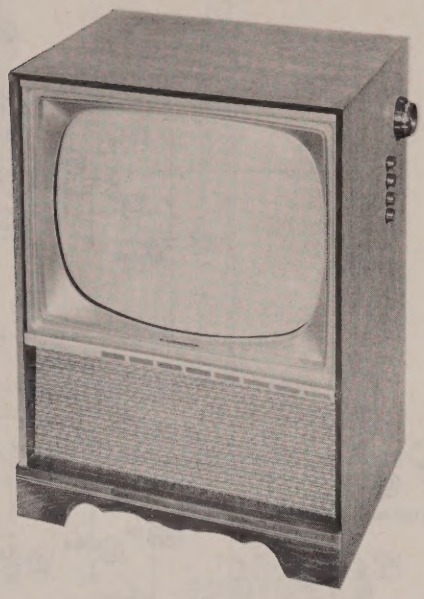
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PHOTOFACT® Folder

PACKARD-BELL MODELS 17VT10, 21VC8, 21VT6 (Ch. V8-3)

PACKARD-BELL MODELS 17VT10, 21VC8, 21VT6 (Ch. V8-3)



MODEL 21VC8 (Ch. V8-3)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type knobs from side of cabinet.
2. Remove 6 wood screws and 1 metal screw holding rear cover. Remove antenna connection. Remove the rear cover.
3. Remove speaker leads, HV lead and picture tube socket.
4. Loosen yoke clamp and slide yoke off the neck of the picture tube.
5. Remove 2 metal screws holding the AC interlock.
6. Remove 4 metal screws holding chassis to cabinet.
7. Remove chassis.

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Packard-Bell	MODELS 17VT10, 21VT6, 21VC8 (Ch. V8-3)	
MANUFACTURER	Packard-Bell Electronics Corp., Service Div., 1920 So. Figueroa St., Lost Angeles 7, Calif.		
TYPE SET	Television Receiver		
TUBES	VHF-Fifteen, UHF-Sixteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 150 Watts, 1.6 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 3 screws holding the trim strip at the bottom edge of the safety glass. Tilt glass out and remove.

FUSE DEVICE

A 7.5Ω fusible resistor is used for low voltage power supply protection. (For location, see "Chassis - Top View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by connecting the lead from pin 6 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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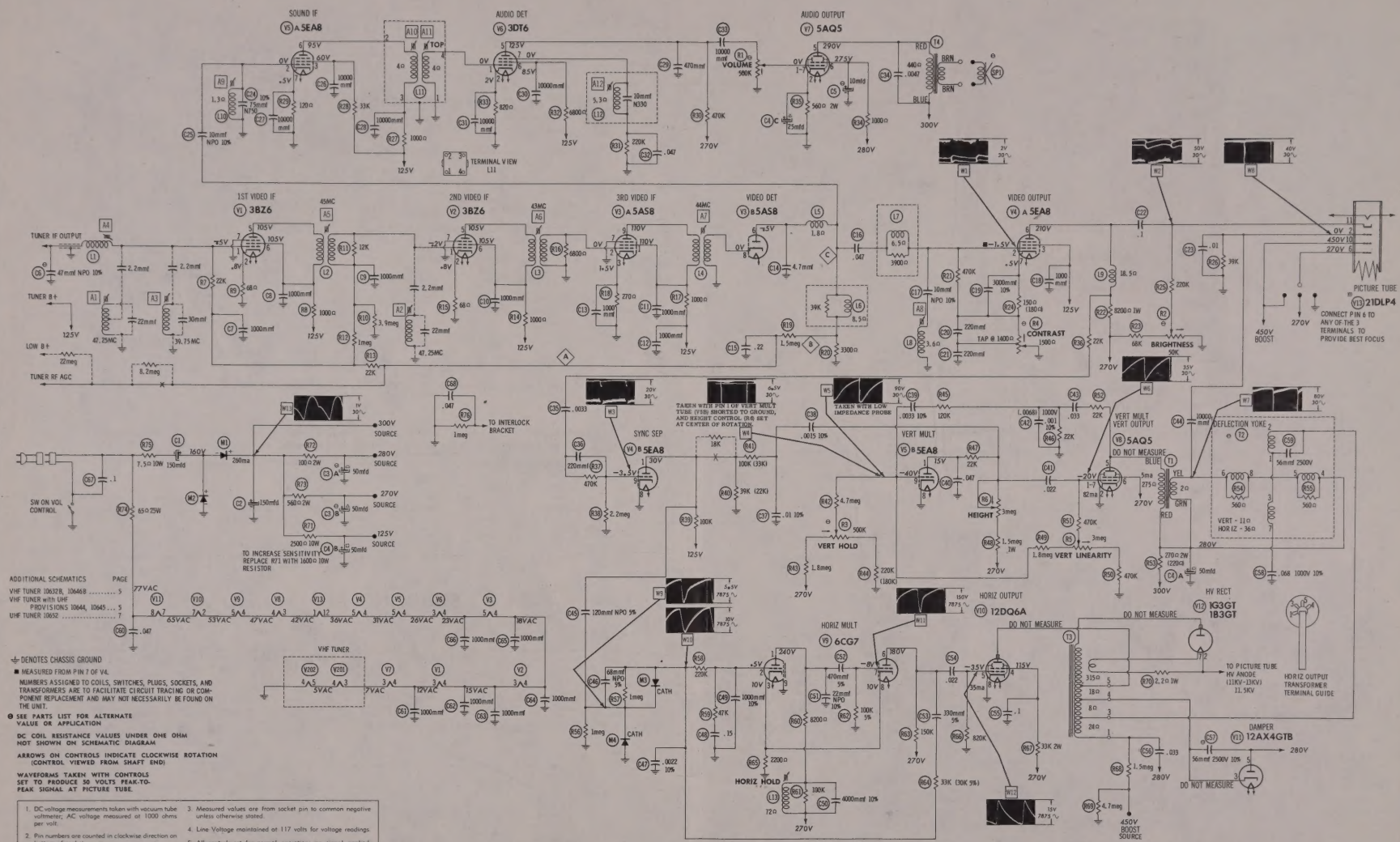
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JA722

SET 474 FOLDER 1


SOUND IF
AUDIO DET
AUDIO OUTPUT
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO DET
VIDEO OUTPUT
SYNC SEP
VERT MULT
HORIZ MULT
HORIZ OUTPUT
HV RECT
DAMPER
VHF TUNER
TUNER IF OUTPUT
TUNER B+
LOW B+
TUNER RF AGC
SW ON VOL CONTROL
TO INTERLOCK BRACKET
TO INCREASE SENSITIVITY REPLACE R73 WITH 1600Ω 10W RESISTOR
VOLUME
CONTRAST
BRIGHTNESS
HEIGHT
VERT HOLD
VERT LINEARITY
HORIZ HOLD
PICTURE TUBE
CONNECT PIN 6 TO ANY OF THE 3 TERMINALS TO PROVIDE BEST FOCUS
DEFLECTION YOKE
TO PICTURE TUBE HV ANODE (11KV-13KV) 11.5KV
HORIZ OUTPUT TRANSFORMER TERMINAL GUIDE
DO NOT MEASURE
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 10632B, 10646B 5
VHF TUNER with UHF PROVISIONS 10644, 10645 5
UHF TUNER 10652 7
DENOTES CHASSIS GROUND
MEASURED FROM PIN 7 OF V4.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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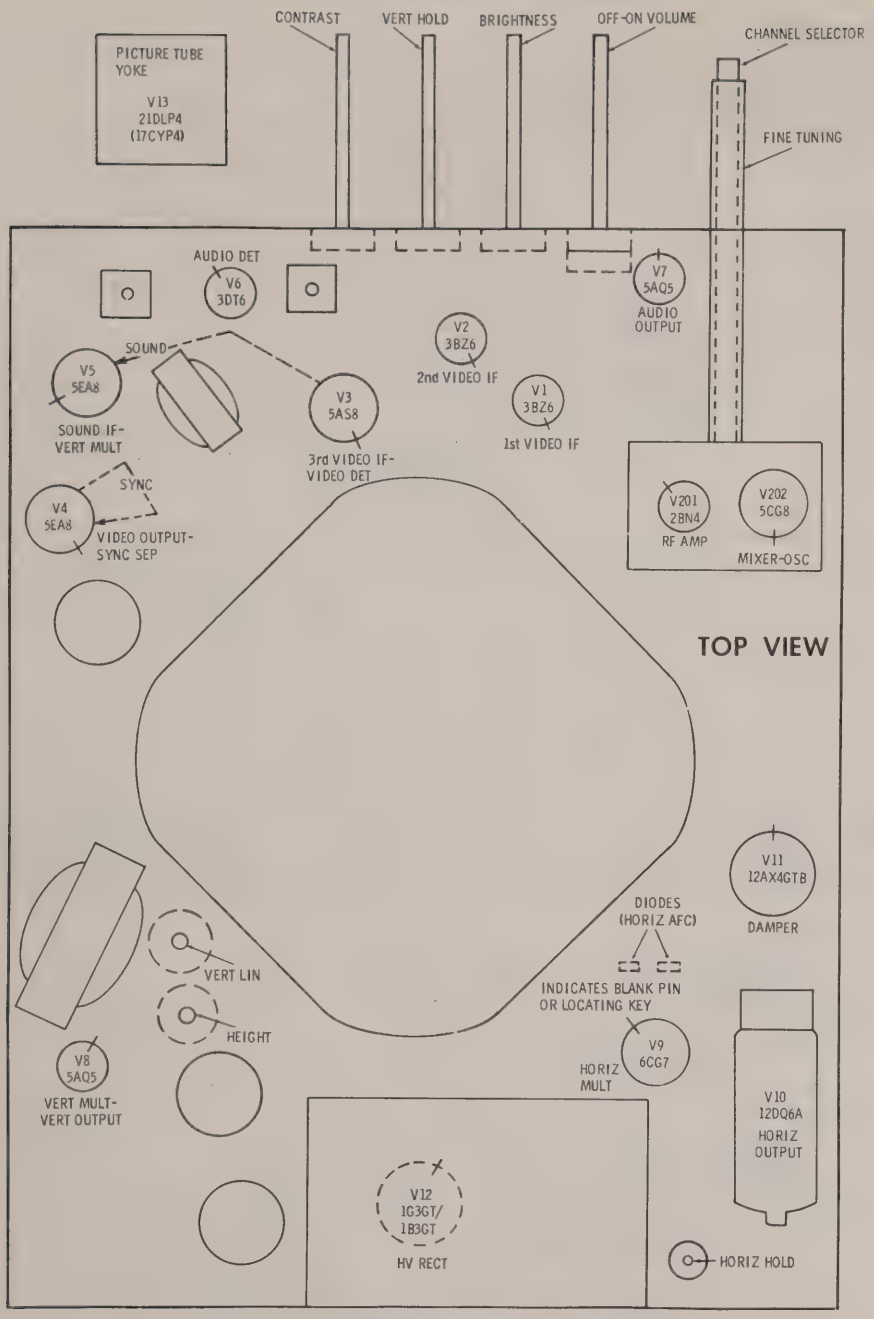
PACKARD-BELL MODELS 17VT10, 21VC8, 21VT6 (Ch. V8-3)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

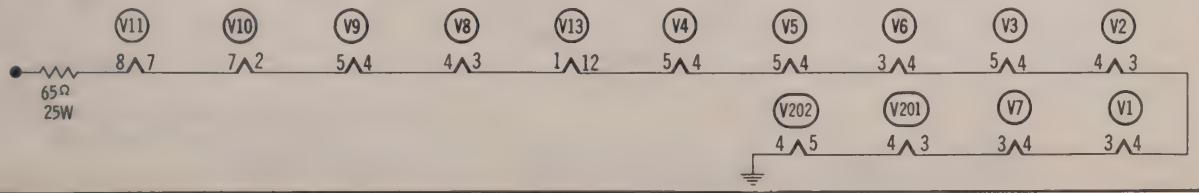
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rect. (B+)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V13
No vertical deflection V5, V8
Poor vert. linearity or foldover V5, V8
Poor horiz. linearity or foldover V9, V10
Narrow picture V9, V10, V11, Rect. (B+)
Vert. off freq. V5
Horiz. off freq. Diode (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V13
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V4
No horiz. sync V4, Diode (Horiz. AFC)
No vert. or horiz. sync V4

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:

Al thru A7, A9 thru A12 ...	GENERAL CEMENT #8721, 8722 WALSCO #2519
A8	GENERAL CEMENT #8282, 8606, 8606L, 9091 WALSCO #2526, 2541, 2543, 2544
Mixer Plate Coil	GENERAL CEMENT #9296, 9297 WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side to ungrounded tube shield floating over Mixer-Osc. (V202), Low side to chassis.	Not used	47.25MC (Unmod)	Any non-interfering channel	USE VTVM DC probe thru 22K to point (B). Common to chassis. (Across Video Det. load)	A1, A2	Adjust for MINIMUM deflection. (Trap not used in some models).
2.	"	"	39.75MC	"	"	A3	"
3.	"	"	45.0MC	"	"	Mixer Plate Coil	Adjust for maximum deflection.
4.	"	"	42.5MC	"	"	A4	"
5.	"	"	45.0MC	"	"	A5	"
6.	"	"	43.0MC	"	"	A6	"
7.	"	"	44.0MC	"	"	A7	"
8.	Across antenna terminals with 120Ω resistor in each lead.	63.0MC (10MC Swp)	41.25MC 43.3MC 45.0MC 45.75MC	3	Vert. Amp. thru 22K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A4 and A7 to control low frequency side of curve, A5 and Mixer Plate Coil to control high frequency side.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9	High side thru .001mfd to point (C). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to point (D). Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10	High side thru .001mfd to point (C). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 7 (grid 3) of Audio Detector. Common to chassis.	A9, A10, A11	Detune A12 to the point where the Sound Detector ceases to oscillate. (This is determined by turning signal generator output to zero and adjusting A12 until meter reads zero). Increase generator output until a voltage is indicated and adjust A9 and A10 for maximum deflection. Reduce signal to a low level and adjust A11 for maximum deflection. (Be sure circuit is not oscillating.)
11.	Disconnect test equipment and tune in a TV signal. Adjust A12 for maximum undistorted sound. Reduce signal level until a hiss is heard in the sound. Retouch A11 for best sound.					

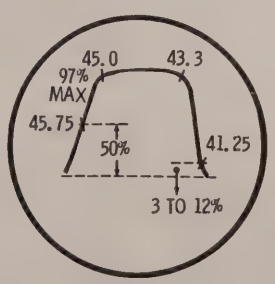
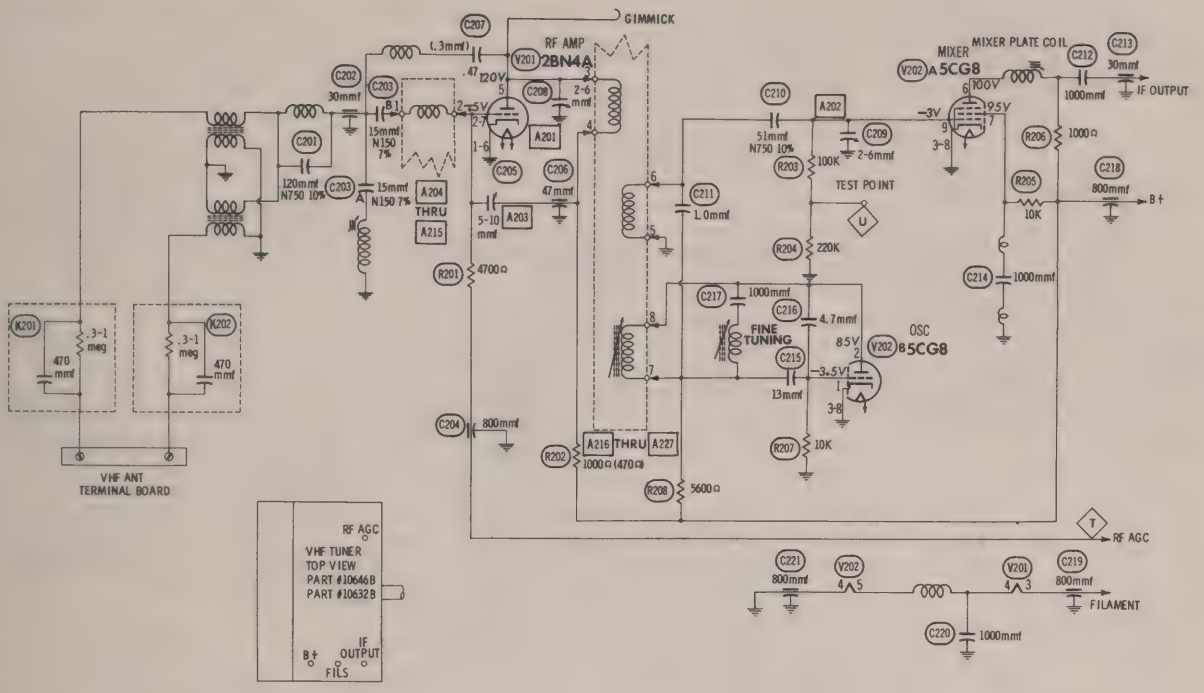


FIG.1



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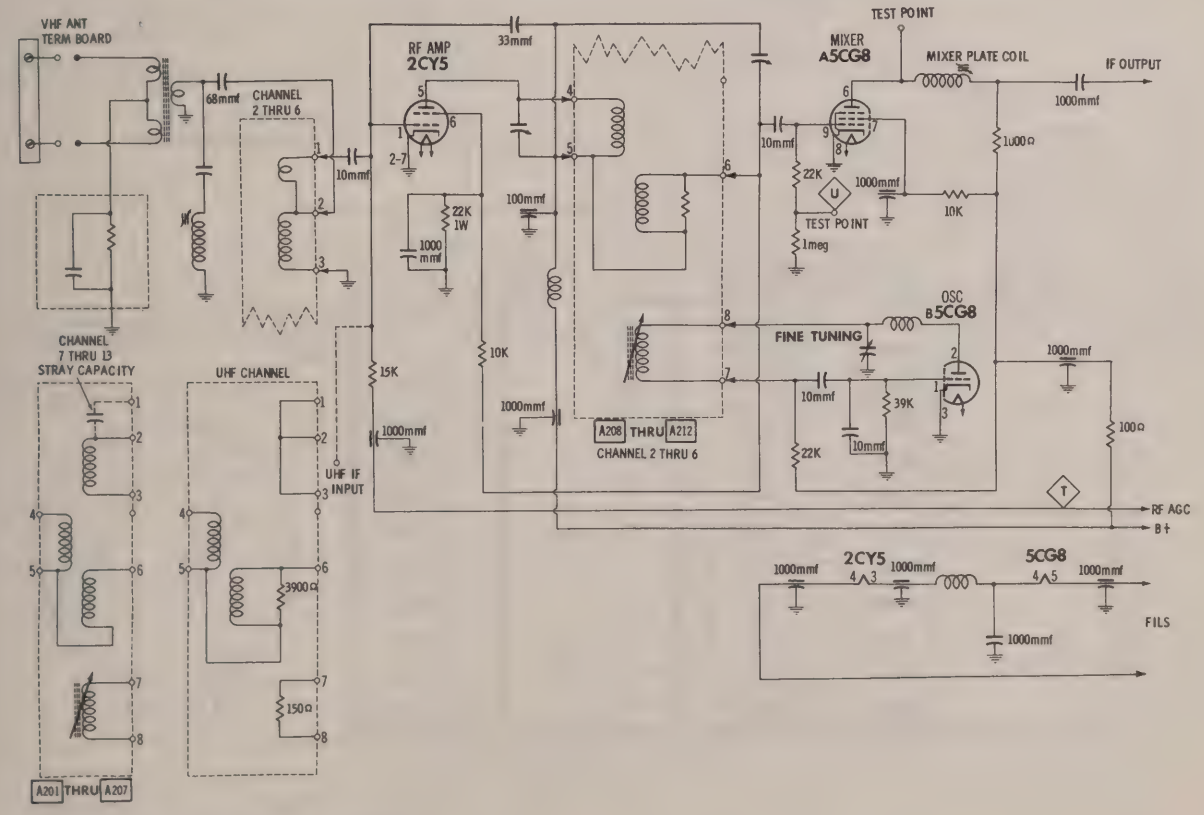
VHF TUNER with UHF Provisions 10632B, 10646B



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VHF TUNER with UHF Provisions - 10644, 10645

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS #10632B & 10646B

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A201, A202, A203.....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512. 2515, 2522, 2523, 2525, 2537
A204 thru A215..... None Required
A216 thru A227..... GENERAL CEMENT #8282
WALSCO #2526

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 2.5 volt bias supply to point (T). Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201 A202 A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

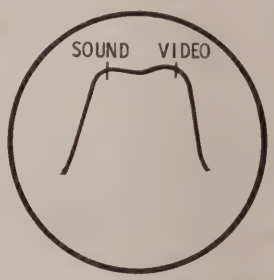


FIG.201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

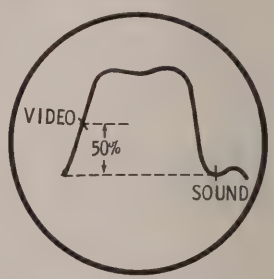


FIG.202

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT FOR TUNERS #10644 & 10645

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: ..... GENERAL CEMENT #8282
WALSCO #2526

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

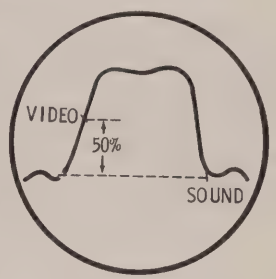
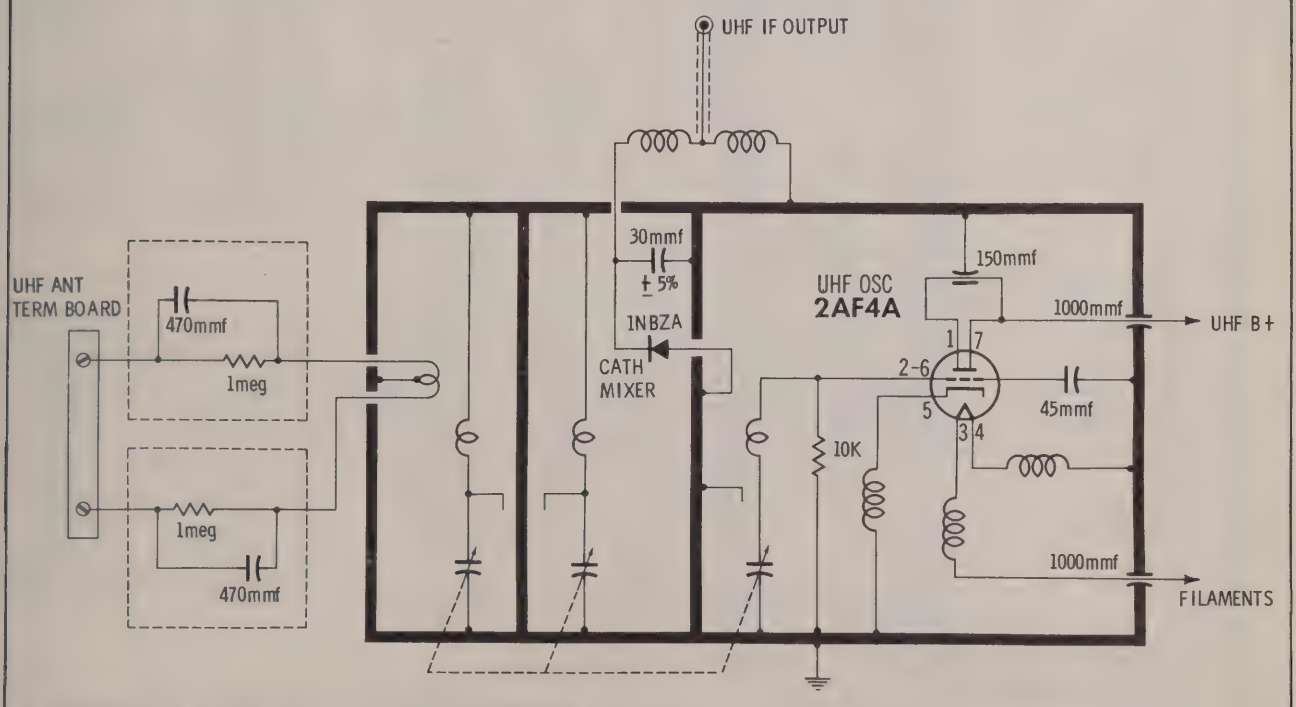


FIG. 201

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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UHF TUNER 10652

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp.	3BZ6
V2	2nd Video IF Amp.	3BZ6
V3	3rd Video IF Amp. - Video Det.	5AS6
V4	Video Output-Sync Sep.	5EA8
V5	Sound IF Amp.-Vert. Mult.	5EA8
V6	Audio Det.	3DT6
V7	Audio Output	5AQ5
V8	Vert. Mult.-Vert. Output	5AQ8
V9	Horiz. Mult.	6CG7
V10	Horiz. Output	12DQ6A
V11	Damper	12AX4GTB
V12	HV Rect.	1G3GT/ 1B3GT

PICTURE TUBE

ITEM No	REPLACEMENT DATA: Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V13	21DLP4 / 17CYP4		21DLP4 ①	21DLP4	21DLP4 ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	150	200	24159	PRI-100	XAG266	WS427	TD-300-200	TVA-1480	
C2	150	350	24160	AFH1-43-20	XA0415	FP140	TM8-52	TVL-1642	
C3A	±50	350	24188 ①	AFH2-59	B0320	FP240	TMD-39	TVL-2767	
B	±50	350							
C4A	±50	350	24187	AFH3-133	C0230	FP377.2	TMT-218	TVL-2767	
B	±50	350					TD-20-25	TVA-1306	
C	±25	25							
C5	10	350	24157 ①	PRS1620	BR1045	TC82	TD-10-450	TVA-1604	

① Alternate 3 section (30mfd, 30mfd, 10mfd @ 350V (Part #34190).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	47 NPO 10%	Note 1	NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C7	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C14	4.7		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C15	.22 200V		P388N-22		CUB22P22	2DP-4-224	GEM-2023	2TM-P22
C16	.047 200V		P388N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	3TM-S47
C17	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C18	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C19	3000 10%		DI-3000		1R3D3	CCD-302	JL-233	10TS-D30
C20	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C21	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C22	.1 400V		P388N-1	DF-104	CUB4P1	4DP-5-104	GEM-4Q1	4TM-P1
C23	.01 600V		P688N-01	D6-103	CUB6S1	4DP-1-103	GEM-611	6TM-S1
C24	75 N750 10%		N750-DI 75	DTN-75	C10Q75U	CCTN-750	CN7-475	10TCU-Q75
C25	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C29	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C32	.047 200V		P388N-047	DD-503	CUB3S47	4DP-3-473	GEM-4147	3TM-S47
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C34	.0047 600V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C35	0033 400V		P488N-0033	D4-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C36	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C37	.01 600V 10%		V84C6S1-10%		P6S6S1	6DP-2-103	GEM-1611	6TM-S10
C38	.0015 400V 10%		V84C5D15-10%		P6MD15	6DP-1-152	GEM-15215	6TM-D15
C39	.0033 400V 10%		V84C4D33-10%		P6MD33	6DP-1-332	GEM-16233	6TM-D33
C40	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C41	.022 600V		P688N-022	DD-303	CUB6S22	6DP-2-223	GEM-6123	6TM-S22
C42	.001 1000V 10%	(.0068 600V)*	DI-1000	DD-102		16DP-1-102	GEM-1621	10TM-D1
C43	.033 600V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C45	120 NPO 5%			DTZ-120			CNO-312	10TCC-T12
C46	68 NPO 5%			DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C47	.0022 400V 10%		V84C4D22-10%		P6MD22	6DP-1-222	GEM-16222	6TM-D22
C48	.15 200V		P388N-15		CUB2P15	2DP-4-224	GEM-2015	2TM-P15
C49	1000 10%		DI-1000	DD-102	1R3D1	CCD-102	GP210	10TS-D10
C50	4000 10%		1464-004			CM-203-392K	MC3S45	MS-34
C51	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C52	470 5%		1469-00047		5RS747	CM-20B-471K	MCJ244	MS-347
C53	330 5%		1469-00033		5RS733	CM-20B-331K		MS-333
C54	.022 600V		P688N-022	DD-303	CUB6S22	6DP-2-223	GEM-6123	6TM-S22
C55	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C56	.033 600V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C57	·56 2500V 10%	#23646, Note 2				VCM-20-560K	3DY-456	
C58	.068 1000V 10%	#23073						10TM-S68
C59	56 2500V		HVD-30-56	DD30-560		VCM-30-560M	3DY-456	30GA-Q56
C60	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C61	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C62	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C63	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C64	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C65	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10

FIXED CAPACITORS (cont)

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C66	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C67	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C68	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

Packard-Bell Part Number. * Alternate value.
Note 1. Models using VHF Tuner 10644 or 10645 use 68mmf NPO 10% in this application (Part #23992).
Note 2. Model 17VT10 uses 82mmf @ 2500V 10% in this application (Part #23659).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	25973	B-60-S	A47-500K-Z	Q31-133	U46	Volume, Note 1
B	Shaft			Not Req.	K28-5	C3 Coupler *	D6-35	
C	Switch			Not Req.	SWE-12	T6-1	U8-36	Power Off-On
R1A	500K	½	25903A	B-60-S	A47-500K-Z	Q31-133	U48	Volume, Note 2
B	Shaft			Not Req.	K28-5	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	T6-1	U8-36	Power Off-On
R2A	50K	½	25974	B-31	A47-50K-S	Q31-123	U38	Brightness, Note 1
B	Shaft			Not Req.	K28-5	C3 Coupler *	D6-36	
R2A	50K	½	25906	B-31	A47-50K-S	Q31-133	U38	Brightness, Note 2
B	Shaft			Not Req.	K28-5	Not Req.	Not Req.	
R3A	500K	½	25975	B-59	A47-500K-S	Q31-133	U50	Vert. Hold, Note 1
B	Shaft			Not Req.	K28-5	C-3 Coupler *	D6-36	
R3A	500K	½	25960A	B-59	A47-500K-S	Q31-133	U50	Vert. Hold, Note 2
B	Shaft			Not Req.	K28-5	Not Req.	Not Req.	
R4	1500Ω	½	25998					Contrast, Note 3
R5A	3meg	½	25967	BX-84	B47-3meg-S	B31-140	BU-59	Vert. Lin.
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R6A	3meg	½	25987	BX-84	B47-3meg-S	B31-140	BU-59	Height
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

* Use part of original shaft.
Note 1. Not used in Model 17VT10.
Note 2. Used in Model 17VT10.
Note 3. Model 17VT10 uses 1500Ω Contrast (Part #25997).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	33K	
R2	1000Ω	
R3	56Ω	
R4	3. 9meg	
R11	18K	
R12	1meg	
R13	22K	
R14	1000Ω	
R15	68Ω	
R16	6800Ω	
R17	1000Ω	
R18	270Ω	
R19	1. 5meg	
R20	3300Ω	
R21	470K	
R22	5300Ω 1W	
R23	68K	
R24	150Ω	
R25	220K	
R26	3. 9K	
R27	1000Ω	
R28	33K	
R29	1200	
R30	470K	

ITEM No.	RATING	REMARKS
R31	220K	
R32	6800Ω	
R33	820Ω	
R34	1000Ω	
R35	560Ω 2W	
R36	22K	
R37	470K	
R38	2. 2meg	
R39	100K	
R40	39K	(22K) *
R41	100K	(33K) *
R42	4. 7meg	
R43	1. 8meg	
R44	220K	(180K)*
R45	120K	
R46	33K	
R47	22K	
R48	1. 5meg 1W	
R49	1. 8meg	
R50	470K	
R51	470K	
R52	22K	
R53	270Ω 2W	(220Ω)*
R54	560Ω	

ITEM No.	RATING	REMARKS
R55	560Ω	
R56	1meg	
R57	1meg	
R58	220K	
R59	47K	
R60	8200Ω	
R61	100K	
R62	100K 5%	
R63	150K	
R64	33K	(30K 5%) *
R66	2200Ω	
R68	820K	
R67	33K 2W	
R65	1. 5meg	
R69	4. 7meg	
R70	2. 2Ω 1W	
R71	2500Ω 10W	#73637
R72	100Ω 2W	
R73	560Ω 2W	
R74	65Ω 25W	#73746
R75	7. 5Ω 10W	#73720
R76	1meg	

* Alternate value. # Packard-Bell Part No.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Gramer PART No	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	1st Video IF	29584A	17-4534	17-4534	TV-131		VF-4	
L2	2nd Video IF	29585	17-4523	17-4523	TV-130	6219	VF-3	
L3	3rd Video IF	29585	17-4523	17-4523	TV-130	6219	VF-3	
L4	4th Video IF	29697	17-4523	17-4523	TV-130	6219	VF-3	
L5	RF Choke	29586	19-1005	19-1005	BC-566	4612		10uh
L6	Shunt Peaking Coil	29808	19-4180	19-4180	TV-183	6179	VP-5 ▲	180uh ①
L7	Series Peaking Coil	29552	19-3093 ▲	19-3093 ▲	TV-181 ▲	6177 ▲	VP-3 ▲	93uh ②
L8	4.5MC Trap	29548A				1470 *		
L9	Shunt Peaking Coil	29713	19-3600	19-3600	TV-305	6246		600uh
L10	1st Sound IF	29053C						
L11	2nd Sound IF	29080D	16-3445	16-3445				
L12	Quadrature Coil	29091A	20-1005	20-1005	TV-134	1480		

▲ Parallel with 3900Ω resistor. * Parallel with 39K resistor. ③ Wound on 3900Ω resistor.
* Disregard tap. ① Wound on 39K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L13	72Ω		29695D	H5-5	TV-165	6210 ▲	H-102	H5-5	Horiz. Stabilizer ▲ Disregard tap.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	29480B	26S84		V319		VO-101	26S84	A-113X
T2	Yoke-Horiz. (18MH) (90°)-Vert. (11MH)	29716	Y-50 ①					Y-50 ①	
	Alt. Yoke	29716A	Y-50 ①②				DY-34A ①②	Y-50 ① ②	Y-49 & NW-2 ②
	Rear Cover & Centering Device	34106B							
T3	Horiz. Output	29496							

① Use original yoke damping network. ② Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	6600Ω	3-4Ω	29500B	24S51 ①	A-3026	AU-604 ①	A-3877 ①	24S51 ①	S-6X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: Packard-Bell PART No.	QUAM PART No.	NOTES
SP1	6" x 9" 4"	PM PM	3-4Ω	53112A ① 53020 ②	69A3	① Model 21VC8 ② Models 17VT10, 21VT6

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: Packard-Bell PART No.	INTERNATIONAL PART No.	ITT PART No	SARKES TARZIAN PART No	SYLVANIA PART No.	NOTES
M1	.280A	72041 ①	SD-500 ①	HA504 ①	40K ①	SR500 ①	① Silicon Type.
M2	.280A	72041 ①	SD-500 ①	HA504 ①	40K ①	SR500 ①	② Selenium Diode
M3		72027 ②	1T1 ②	1215 ②			
M4		72027 ②	1T1 ②	1215 ②			

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M5	Tuner	10646B	VHF
	Tuner	10632B	VHF
	Tuner	10644	VHF
	Tuner	10645	VHF
	Tuner	10652	UHF

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

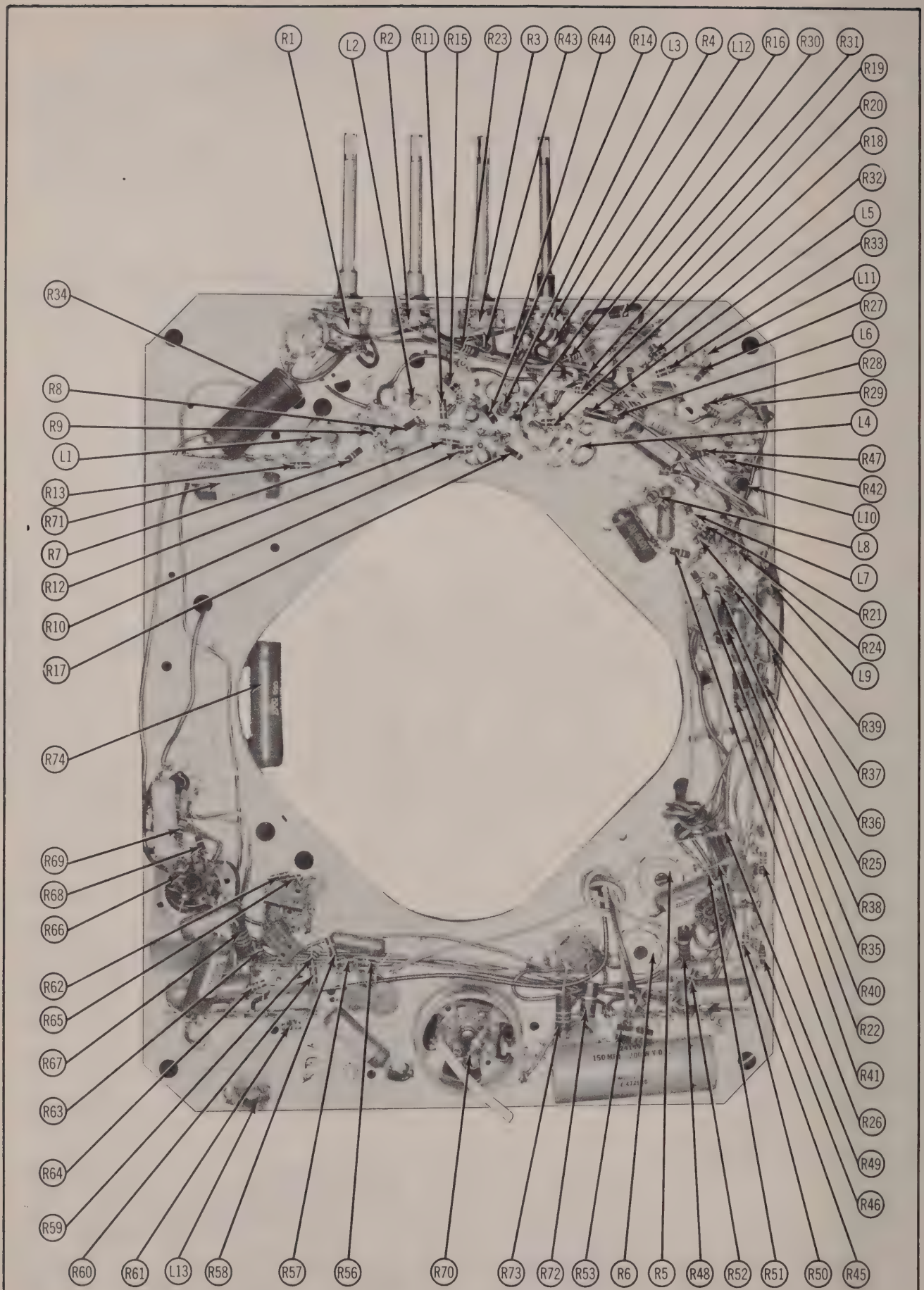
NAME	PART NO.	DESCRIPTION
Safety Glass	55088	Model 17VT10
Safety Glass	55090A	Models 21VT6, 21VC8
Mask	55108B	Picture Tube, Model 17VT10
Mask	55126A	Picture Tube, Models 21VT6, 21VC8
Knob	52301	VHF Channel Selector
Knob	52250-B	UHF Channel Selector (Specify color)
Knob	52199A	VHF Fine Tuning
Knob	52349-3A	UHF Fine Tuning (Specify color)
Knob	52298-1	Volume
Knob	52298-2	Brightness
Knob	52298-4	Contrast
Knob	52298-3	Vert. Hold

WIRING DATA

High Voltage Lead	Use BELDEN No. 8859
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8736 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8474
300Ω Tuner Input Lead	Use BELDEN No. 8235
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

PACKARD-BELL MODELS 17VT10, 21VC8, 21VT6 (Ch. VB-3)

FOLDER 1



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

TUNER 10646B

TUNER PARTS LIST AND DESCRIPTIONS

10632B, 10646B

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amplifier	2BN4A

ITEM No.	USE	TYPE
V202	Mixer Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N750 10%			TCZ-120	C10T12U	CCTN-121	CN7-312	10TCU-T12
C202	30							
C203A	15 N150 7%					*		10TCP-Q15
B	15 N150 7%					*		10TCP-Q15
C204	800		EF-001	MFT-1000		CCF-102	CT280A	
C205	5-10			829-10				
C206	47							
C207	.47	(.3mmf) **	NPO-SI. 5	TCZ-R5				
C208	2-6			829-6		CV-3	CT552	
C209	2-6			829-6		CV-3	CT552	
C210	51 N750 10%		N750-DI 47	DTZ-50	C10Q51U		CN7-447	10TCU-Q47
C211	1.0		NPO-SI 1.0	TCZ-1		CCTN-470	CNO-510	10TCC-V10
C212	1000		BPD-001	DD-102	BYA10D1		B-210	5HK-D10
C213	30					CCD-102		
C214	1000		BPD-001	DD-102	BYA10D1		B-120	5HK-D10
C215	13			TCZ-12	C10Q13C	CCTO-120	CNO-412	10TCC-Q12
C216	4.7		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C217	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C218	800		EF-001	MFT-1000		CCF-102	CT280A	
C219	800		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C221	800		EF-001	MFT-1000		CCF-102	CT280A	

** Alternate value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	4700Ω	
R202	1000Ω	(470Ω) *
R203	100K	

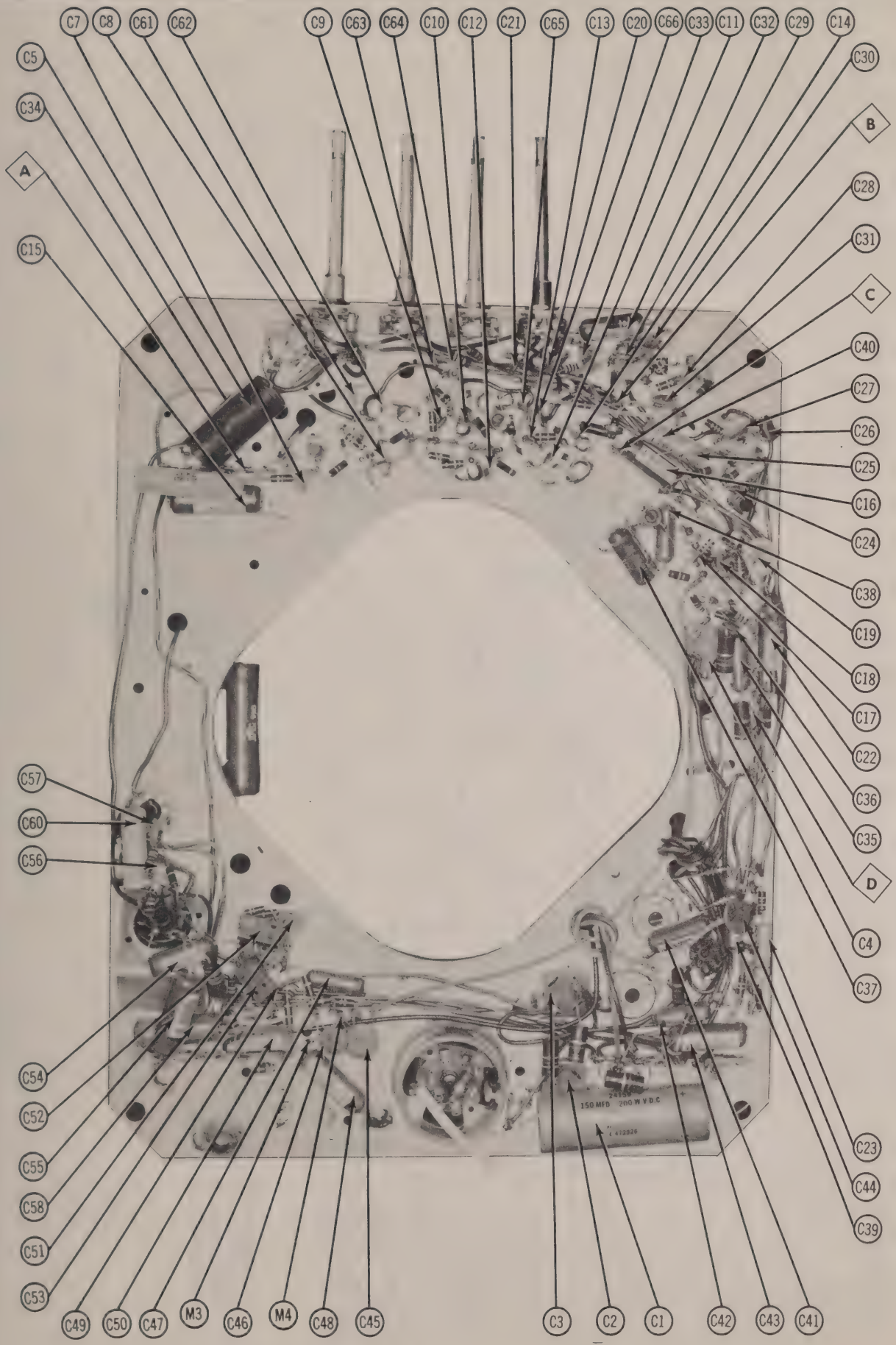
ITEM No.	RATING	REMARKS
R204	220K	
R205	10K	
R206	1000Ω	

ITEM No.	RATING	REMARKS
R207	10K	
R208	5600Ω	

* Alternate Value

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Packard-Bell PART No.	REPLACEMENT DATA
K201	Antenna Isolation	470mmf, .3-1meg		Centralab RC-471 Sprague AC1-1
K202	Antenna Isolation	470mmf, .3-1meg		Centralab RC-471 Sprague AC1-1



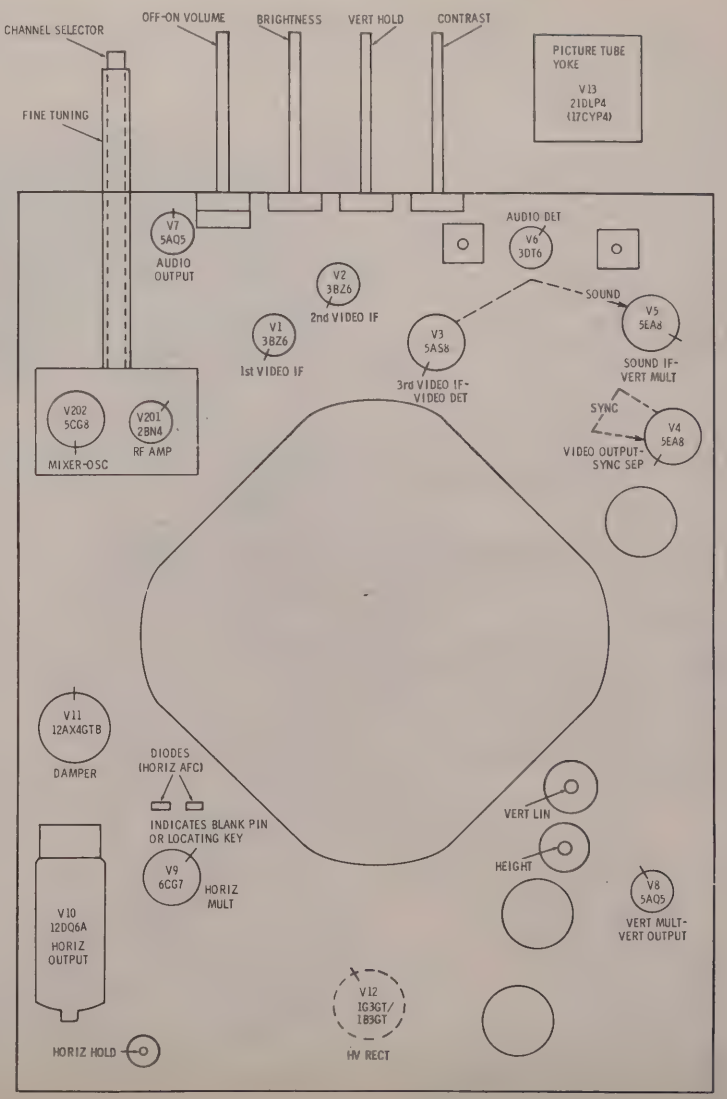
CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.

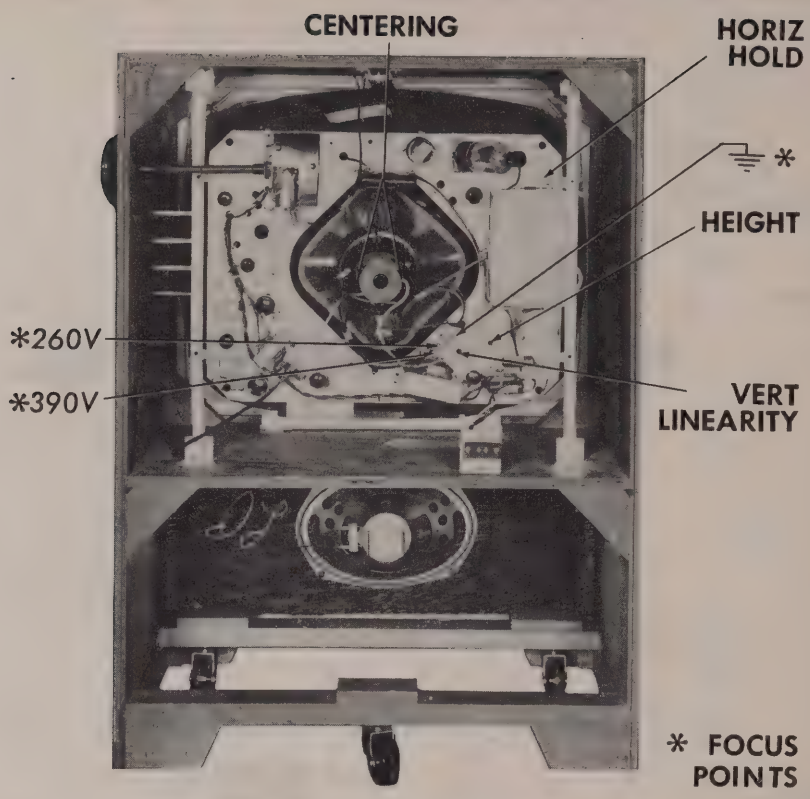
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	1.2meg	68Ω	3Ω	3.5Ω	†3500Ω	†3500Ω	0Ω		
V2	3BZ6	1.6meg	68Ω	3.5Ω	4Ω	†3500Ω	†3500Ω	0Ω		
V3	5AS8	†3500Ω	.2Ω	270Ω	4Ω	5.5Ω	3300Ω	0Ω	.2Ω	†3500Ω
V4	5EA8	†45K	•470K	†2500Ω	7.5Ω	9Ω	†8200Ω	•500Ω	0Ω	2.2meg
V5	5EA8	•†3.5meg	1.3Ω	†35K	6Ω	7.5Ω	†3500Ω	120Ω	0Ω	•2.9meg
V6	3DT6	4Ω	820Ω	6Ω	5.5Ω	†470K	†7300Ω	220K		
V7	5AQ5	0Ω	560Ω	1.5Ω	3Ω	†440Ω	†110Ω	0Ω		
V8	5AQ5	•2.5meg	0Ω	10.5Ω	12Ω	†545Ω	†560Ω	•2.5meg		
V9	6CG7	†8800Ω	700K	2200Ω	12Ω	13.5Ω	†150K	100K	2200Ω	0Ω
V10	12DQ6A	NC	13.5Ω	TP	†33K	820K	NC	15Ω	0Ω	TOP CAP †18Ω
V11	12AX4GTB	NC	NC	¶8meg	TP	†100Ω	NC	15Ω	18.5Ω	
V12	1G3GT/1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †333Ω
V13	21DLP4	10.5Ω	39K	Pin 6 †560Ω	Pin 10 †1.2meg	Pin 11 •230K	Pin 12 9Ω			
V201	2BN4A	0Ω	1.2meg	1.5Ω	1Ω	†3500Ω	0Ω	1.2meg		
V202	5CG8	10K	†8100Ω	0Ω	0Ω	1Ω	†3500Ω	†12K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 300V SOURCE.
‡ MEASURED FROM PIN 3 OF V11.
NC NO CONNECTION.
TP TIE POINT.

TUBE PLACEMENT CHART





CABINET—REAR VIEW

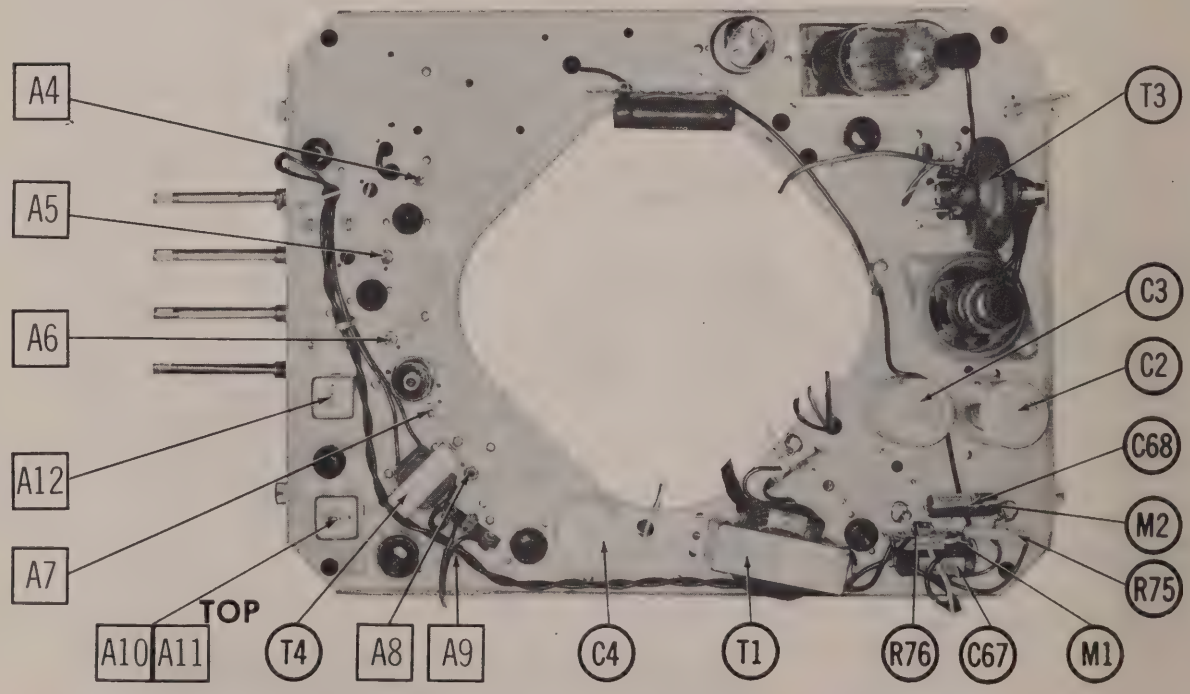
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.



CHASSIS—TOP VIEW

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EIA

TRUETONE
MODEL 2DC3030A

TRUETONE
MODEL 2DC3030A

MODEL 2DC3030A

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MODEL 2DC3030A

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TRUETONE
MODEL 2DC3030A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 metal screws holding rear cover. Remove antenna connections. Remove rear cover.
2. Remove 6 push-on type knobs from side of cabinet.
3. Remove 2 screws holding interlock bracket.
4. Remove yoke leads, speaker leads, and picture tube socket.
5. Remove speaker.
6. Lay receiver face down on a soft surface.
7. Remove 2 chassis bolts from the bottom of the cabinet, and 2 from the top inside. Unsolder isolation unit from cabinet.
8. Lift chassis part way out, then remove HV lead and pic-tube tube mounting bracket ground wire.
9. Lift chassis.

PICTURE TUBE REMOVAL

1. Remove rear cover. (See Step 1 "Chassis Removal".)
2. Remove picture tube socket and yoke.
3. Remove 2 screws holding handle and antenna assembly.
4. Remove 2 screws on each side and one at bottom holding front escutcheon.
5. Pull escutcheon out part way and disconnect HV lead and picture tube mounting bracket ground wire.
6. Remove escutcheon.
7. Remove 4 screws holding picture tube mounting strap.
8. Remove picture tube.

MODEL 2DC3030A

CAUTION
ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

TRADE NAME	Truetone Model 2DC3030A
SUPPLIER	Western Auto Supply Co., 2107 Grande Avenue, Kansas City, 8, Mo.
TYPE SET	Television Receiver
TUBES	VHF-Thirteen, UHF-Fourteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 110 Watts, 1.15 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube and safety glass cleaning, it is necessary to remove the chassis and the picture tube. (See "Disassembly Instructions".)

FUSE DEVICE

A 4.7Ω fusible resistor is used for low voltage power supply protection. (For location, see "Chassis Top View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug (B1). (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke on the neck of the picture tube.

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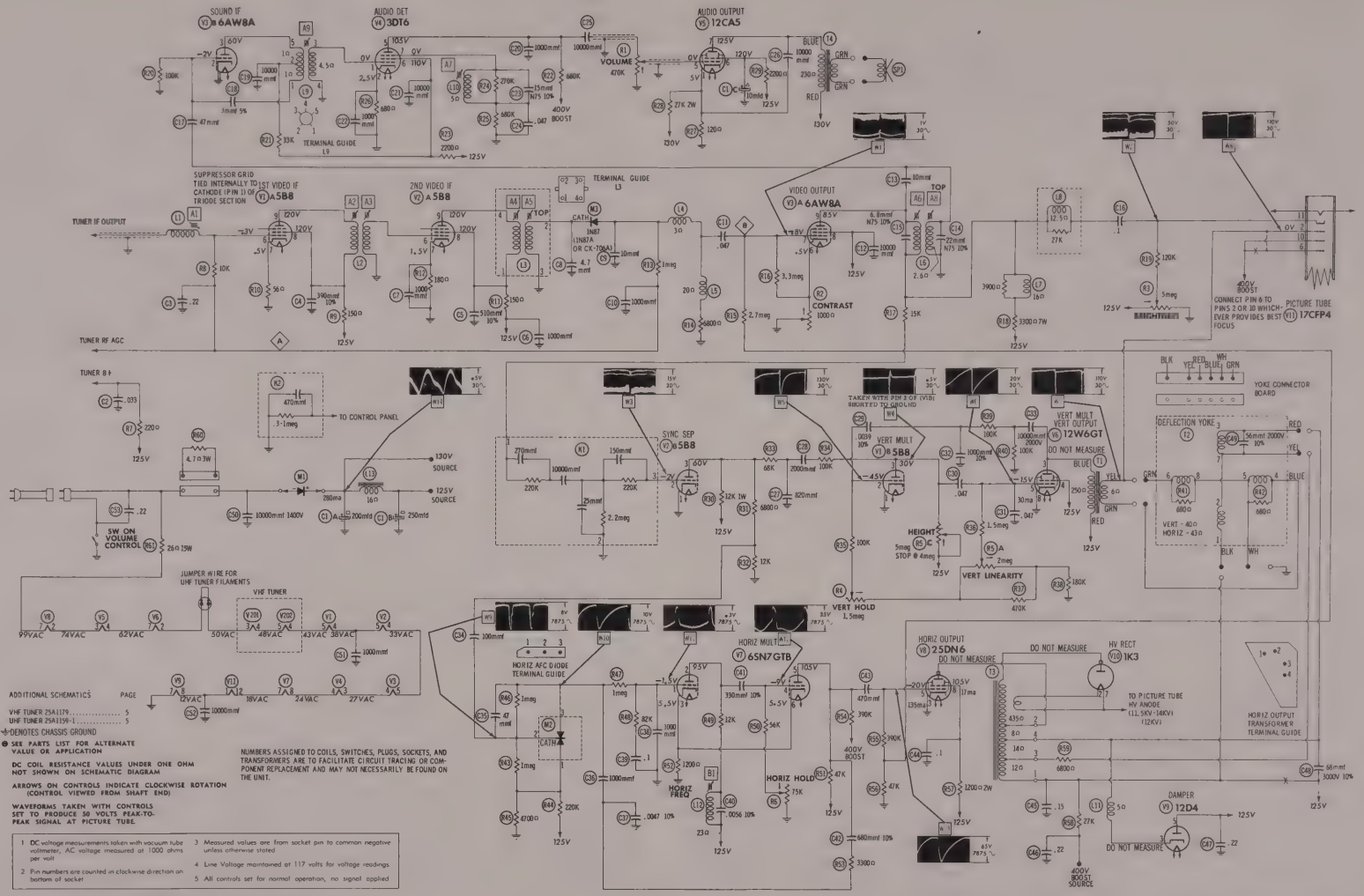
TRUETONE MODEL 2DC3030A
TRUETONE MODEL 2DC3030A
SET 474 FOLDER 2


SOUND IF V3 6AW8A
AUDIO DET V4 3DT6
AUDIO OUTPUT V5 12CA5
VOLUME 470K
TERMINAL GUIDE L9
SUPPRESSOR GRID TIED INTERNALLY TO CATHODE (PIN 1) OF TRIODE SECTION
1ST VIDEO IF V1 A 5B8
2ND VIDEO IF V2 A 5B8
TERMINAL GUIDE L3
VIDEO OUTPUT V3 A 6AW8A
TOP
TUNER IF OUTPUT
TUNER RF AGC
TUNER B+
CONTRAST 1000Ω
CONNECT PIN 6 TO PINS 2 OR 10 WHICHEVER PROVIDES BEST FOCUS
PICTURE TUBE V11 17CFP4
400V BOOST
TO CONTROL PANEL
130V SOURCE
125V SOURCE
SW ON VOLUME CONTROL
JUMPER WIRE FOR UHF TUNER FILAMENTS
VHF TUNER
99VAC 74VAC 62VAC 50VAC 48VAC 43VAC 38VAC 33VAC
12VAC 18VAC 24VAC 27VAC
SYNC SEP V1 B 5B8
VERT MULT V1 B 5B8
VERT MULT VERT OUTPUT V6 12W6GT
TAKEN WITH PIN 2 OF (V1B) SHORTED TO GROUND
DO NOT MEASURE
DEFLECTION YOKE
YOKE CONNECTOR BOARD
HEIGHT
VERT LINEARITY
VERT HOLD 1.5meg
VERT - 40Ω
HORIZ - 43Ω
HORIZ AFC DIODE TERMINAL GUIDE
HORIZ MULT V7 6SN7GTB
HORIZ FREQ
HORIZ HOLD 75K
HORIZ OUTPUT V8 25DN6
HV RECT V10 1K3
TO PICTURE TUBE HV ANODE (11.5KV-14KV) (12KV)
HORIZ OUTPUT TRANSFORMER TERMINAL GUIDE
DAMPER V9 12D4
400V BOOST SOURCE
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 25A1179-1 5
UHF TUNER 25A1159-1 5
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied

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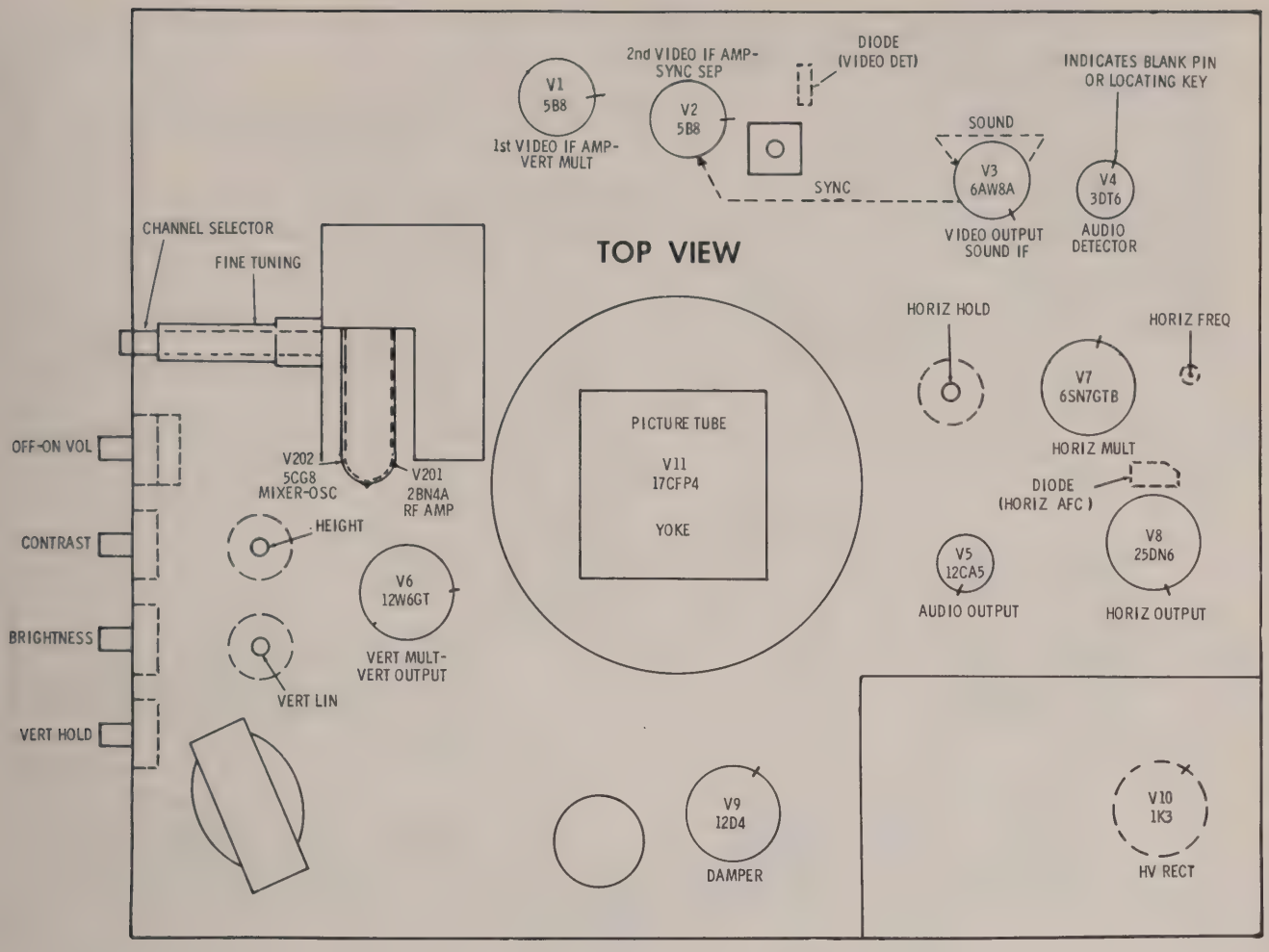
TRUETONE
MODEL 2DC3030A

TUBE PLACEMENT CHART



TRUETONE
MODEL 2DC3030A

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

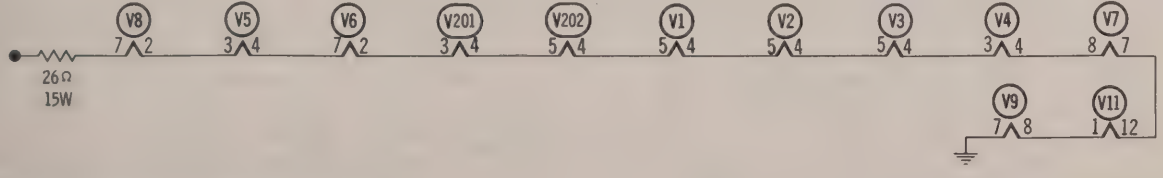
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (Line), Rect. (B+)

SWEEP FAILURE
No raster, has sound V7, V8, V9, V10, V11
No vertical deflection V1, V6
Poor vert. linearity or foldover V1, V6
Poor horiz. linearity or foldover V7, V8. V9
Narrow picture V7, V8, V9, Rect. (B+)
Vert. off freq. V1
Horiz. off freq. Diode (Horiz. AFC), V7

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V11
Has pic, no sound V3, V4, V5

SYNC FAILURE
No vert. sync V2
No horiz. sync V2 , Diode (Horiz. AFC)
No vert. or horiz. sync V2

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools ..... General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544, or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Disable the tuner oscillator by replacing the oscillator tube (V202) with one having the oscillator grid pin removed.
Short the antenna terminals together but not to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp)	42.75MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector (Fig.1) to pin 9 (plate) of 5B8 (V1). Low side to chassis.	Mixer Plate Coil & A1	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
2.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of 5B8 (V1). Low side to chassis.	"	"	"	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V2). Low side to chassis.	A2, A3	"
3.	"	High side to pin 6 (grid) of 5B8 (V2). Low side to chassis.	"	"	"	Vert. Amp. thru 10K to point (B). Low side to chassis. (Across video det. load).	A4, A5	"
4.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	"	"	"	"		Retouch Mixer Plate Coil and A1 thru A5 as required for response similar to Fig. 3. Remove bias and replace V202 in its socket.

SOUND IF ALIGNMENT

Set the contrast control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000mmf Ceramic Capacitor	High side to point (B). Low side to chassis.	Not used	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A6	Turn A6 and A8 almost out of coil forms. Then adjust A6 for MINIMUM scope indication.
6.	"	"	4.5MC (15KC Swp)	Not used	"	Across speaker voice coil	A7, A8, A9	Use only enough sweep generator output to provide a usable pattern on scope. Turn A7 fully clockwise, then counter clockwise for maximum scope indication. Adjust A8 and A9 for maximum scope indication. Remove test equipment and tune in a local TV station. Retouch A7 for MINIMUM buzz.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

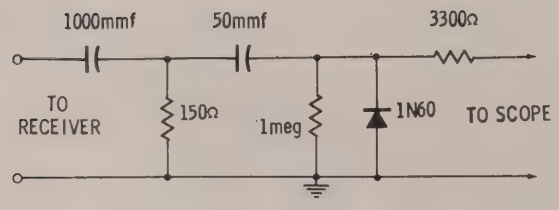


FIG. 1

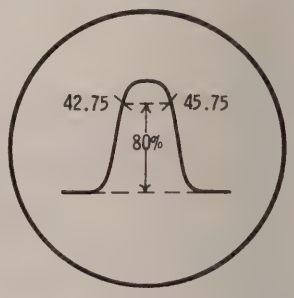


FIG. 2

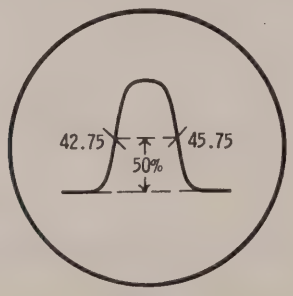


FIG. 3

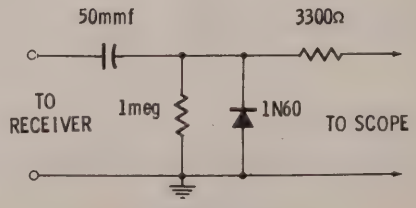
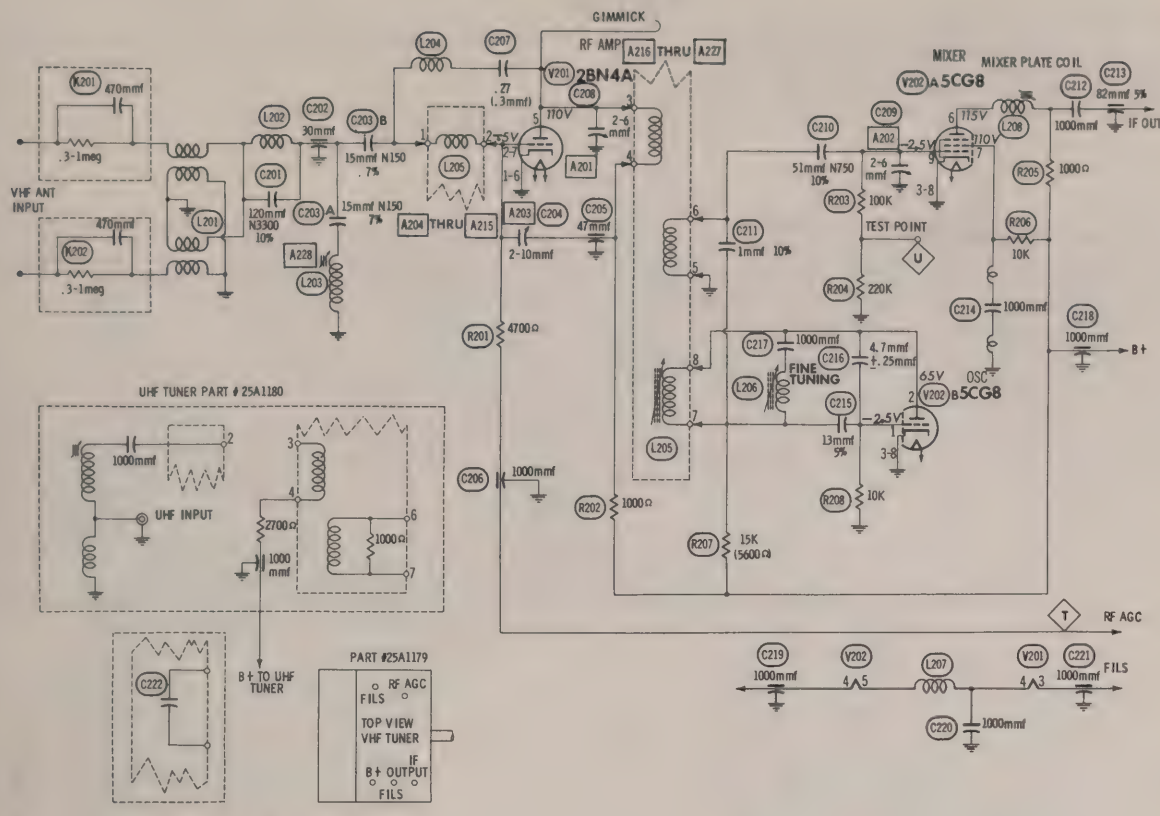


FIG. 4



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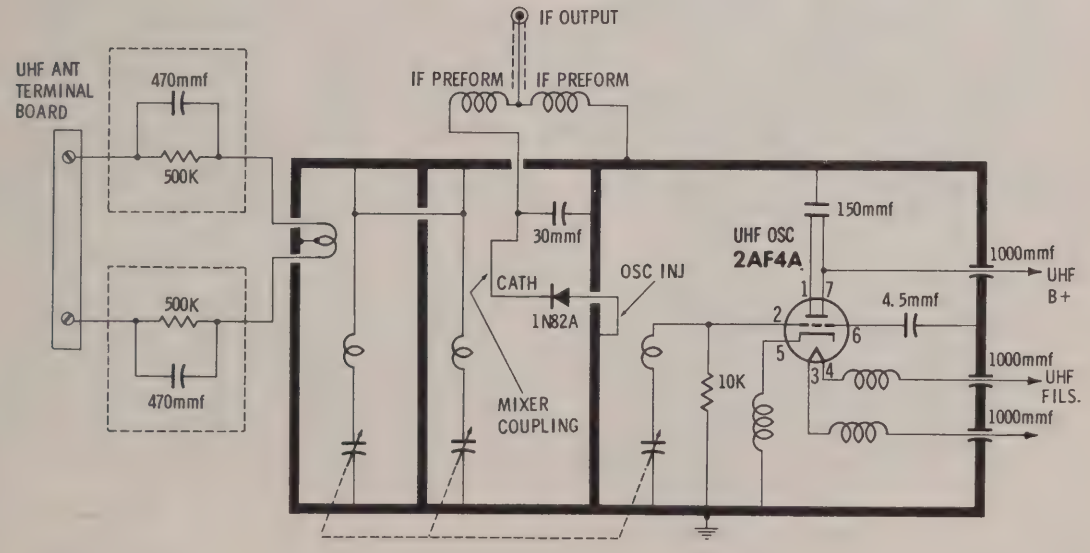
VHF TUNER with UHF Provisions 25A1179



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UHF TUNER 25A1159-1

TUNER ALIGNMENT INSTRUCTIONS
25A1179

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER to PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A201, A202, A203 .... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A228 ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 2.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope. Recheck A201.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

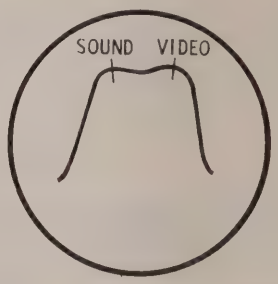


FIG.201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

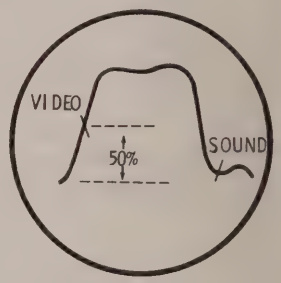


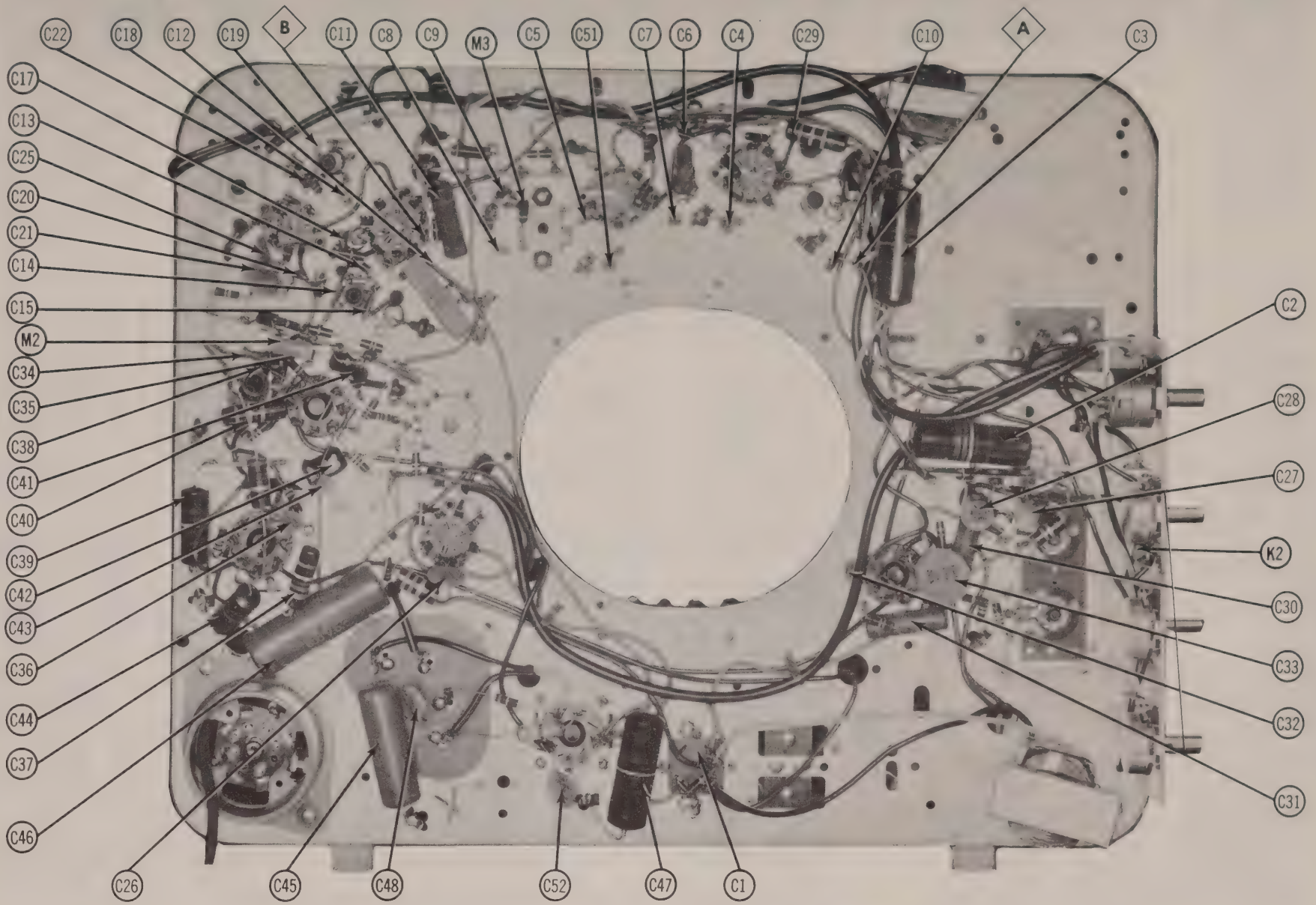
FIG.202

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

TRAP ADJUSTMENT

Some types of interference may be reduced by adjusting A228. Tune in the channel where interference occurs and adjust A228 for MINIMUM interference while observing the picture.



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp.-	
	Vert. Mult	5B8
V2	2nd Video IF Amp.-	
	Sync Sep.	5B8
V3	Video Output-Sound IF Amp	6AW8A
V4	Audio Detector	3DT8
V5	Audio Output	12CA5
V6	Vert. Mult.-Vert. Output	12W8GT
V7	Horiz. Mult.	5SN7GTB
V8	Horiz. Output	25DN6
V9	Damper	12D4
V10	HV Rect.	1K3

PICTURE TUBE

ITEM No	REPLACEMENT DATA: TRUETONE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V11	17CYP4			17CYP4	17CYP4 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	±200	200	45X445	AFH3-13-90	XCH239	FP318.8		TVLS-3453 *	
B	±250	200							
C	±10	200							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.033 200V		P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-6133	47M-S33
C3	.22 200V		P288N-22		CUB2P22	SDP-4-224	GEM-2022	27M-P22
C4	396 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C5	510 10%		DI-500	DD-511	6RS7S1	CCD-501	GP350	10TS-T50
C6	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C7	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C8	4.7		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C9	10		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C11	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	27M-S47
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C13	10		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C14	22 N75 10%	#60X33						
C15	6.8 N75 10%	#60X33						
C16	.1 200V		P288N-1	DP-104	CUB2P1	SDP-3-104	GEM-301	27M-P1
C17	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C18	3 5%		NPO-SI 3.0	D6-030	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C20	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C22	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C23	15 N75 10%	#60X31						
C24	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	27M-S47
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C27	820		DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C28	3000		BPD-002	DD-202	BYA10D2	CCD-302	GP230	5HK-D30
C29	.0039 400V 10%		V54C6D4 10%		PMSD4	6DP-1-392	GEM-1624	5BF-D39
C30	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	27M-S47
C31	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	27M-S47
C32	1000 10%		DI-1000	DD-102	1RSD1	CCD-102	GP210	10TS-D10
C33	10000 2000V	#47X764					2HV-U10	BL-S10
C34	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C35	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C36	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C37	.0047 400V 10%		V54C4D47 10%		PMSD47	6DP-1-472	GEM-16247	5TM-D47
C38	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C39	.1 200V		P288N-1	DP-104	CUB2P1	SDP-3-104	GEM-301	27M-P1
C40	.0056 400V 10%					6DP-1-562	GEM-16256	5BF-D56
C41	330 10%		1469-00033	DD-331	5RS7S3	CM-30B-331K	MCB241	MS-333
C42	680 10%		1469-00068	DD-681	1RS7S8	CM-20B-681K	MCJ249	MS-368
C43	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C44	.1 200V		P288N-1	DP-104	CUB2P1	SDP-3-104	GEM-301	27M-P1
C45	.15 600V		P688N-15		CUB6P15	6DP-5-154	GEM-6015	67M-P15
C46	.22 600V		P688N-22		CUB6P22	6DP-5-224	GEM-6022	67M-P22
C47	.22 200V		P288N-22		CUB2P22	SDP-4-224	GEM-2022	27M-P22
C48	68 3000V 10%	#47X763					3DY-468	
C49	56 2000V 10%	†					2DY-456	
C50	10000 1400V		DAC-27	DD16-103	HVR1S81	16DP-3-103	UAC-U0	BL-S10
C51	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C52	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C53	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	47M-P22

* Truetone Part No. † Part of T2.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	470K	½	40X444	B-50-S	A47-500K-Z	Q13-133	TA50A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWR-12	76-	U8-38	Power Off-On
R2	1000Ω	½	40X439	B-505		Q17-108	U3	Contrast
R3A	5meg	½	40X440	B-57	A47-5meg-S	Q11-141	TA58L	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1.5meg	½	40X441	B-742	A47-1.5meg-S	Q11-138	TA15L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	5meg	½	40X443	AB-T5	B47-2meg-S	Bil-139	PTA58L	Vert. Lin.
B	Shaft			AK-19	Not Req.	T344	Not Req.	
C	5meg	½		AB-S5 *	B47-5meg-S*	Bil-141 *	PTA58L *	Height
	4meg Stop							
D	Shaft			AK-19	Not Req.	T344	Not Req.	

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R8A	75K	½	40X443	B-35	B47-100K-S	Bil-128	PTA15L	Horiz. Hold
B	Shaft			Not Req.	Not Req.	T344	Not Req.	

* Use 1meg resistor in series with right hand terminal viewed from shaft end terminals down.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R7	330Ω	
R8	10K	
R9	150Ω	
R10	56Ω	
R11	100Ω	
R13	180Ω	
R15	1meg	
R16	2.7meg	
R17	3.3meg	
R18	15K	
R18	3300Ω 7W	#43X393
R19	120K	
R20	100K	
R21	33K	
R22	680K	
R23	2300Ω	
R24	270K	
R25	680K	
R36	680Ω	
R37	120Ω	
R38	27K 2W	
R39	1200Ω	
R30	12K 1W	
R31	6800Ω	
R32	12K	
R33	88K	
R34	100K	
R35	100K	
R36	1.5meg	
R37	470K	
R38	180K	
R39	100K	
R40	100K	
R41	680Ω	
R42	680Ω	
R43	1meg	
R44	220K	
R45	4700Ω	
R46	1meg	
R47	1meg	
R48	82K	
R49	12K	
R50	56K	
R51	47K	
R52	1200Ω	
R53	3300Ω	
R54	390K	
R55	390K	
R56	47K	
R57	1200Ω 2W	
R58	27K	
R59	6800Ω	
R60	4.7Ω 3W	#43X394
R61	26Ω 15W	#43X392

† Truetone Part No.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
K1	Sync Sep. Grid	22mmf, 160mmf, 270mmf, 10000mmf, 220K, 220K, 2.2meg	76X14	
K2	Control Panel Isolation	470mmf, .3-meg	76X11	Centralab RC-471 Sprague AC1-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No.	NOTES
L1	1st Video IF	9A2427			TV-131		VF-4	
L2	2nd Video IF	9A2444						
L3	3rd Video IF	9A2438						
L4	Resonant Choke	9A2431						17uh
L5	Shunt Peaking Coil	36A34	19-4400	19-4400	TV-190	6134	VP-7	360uh
L6A	Sound Take-Off	9A2435			TV-130			
B	4.5MC Trap							
L7	Shunt Peaking Coil	36A33	19-4201 *	19-4201 *	TV-197 *	6154 *		220uh①
L8	Series Peaking Coil	36A43	19-4160 ▲	19-4160 ▲	TV-196 ▲	6130 ▲		150uh ②
L9	Sound IF	9A2432						
L10	Quadrature Coil	9A2426	20-1007 ▲	20-1007 ▲	TV-121 ■			
L11	RF Choke	9A2433						7.5uh ③

* Parallel with 3900Ω resistor.
▲ Drill new mounting hole.
■ Remove C23 (18mmf cap.)
▲ Parallel with 27K resistor.
① Wound on 3900Ω resistor.
② Wound on 27K resistor.
③ IRC Part #CLA.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Rom PART No.	Thordarson PART No.	NOTES
L12	23Ω		9A2430	HS-7	TV-165 ▲	6210	H-102	HS-7	Horiz. Osc. ▲ Disregard tap.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE @ CURRENT 1000 ~(~)	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L13	.280A	15Ω	.4 Hy.	52X102			F-801			C-27X

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	51X193	26875 ①	A-2815 ①			VO-109 ①	26875 ①	A-117X
T2	Yoke-Horiz. (25MH)	9A2433	Y-16 ②③	MDF-92	Y90F19/43	PCM2045	DY-16A	Y-16 ②③	Y-45 &
	(90°)-Vert. (28MH)			②③	②③	②③	②③		NW-19 ②
	Rear Cover &	2A489							YC-1 &
	Centering Device								CL-1
	Yoke Clamp	30X811							
T3	Horiz. Output	53X372	FLY-146 *	HVO-134 *	X154 *		HO-297 *	FLY-146 *	D-124 *

① Use 6 to 1 turns ratio.
② Use original rear cover, centering device, and yoke damping network, if necessary.
③ Connect same as original.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	2	2	2	2		2	2	2
	4	4	4	4		4	4	4
	3	3	3	3		3	3	3
	1	1	1	1		1	1	1
Special Notes →		④	⑤	③		④	④	④

④ Remove one turn from filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	4500Ω	3-4Ω	51X192	24548	A-3026	AU-601	A-3877	24548	S-6X	

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	12A560	4A05	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: TRUETONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.280A	66X19 ①	SD600 ①	HF504 ①	M500 ①	SR500 ①	① Silicon Type.
M2		66X21 ②	SD-91 ①③	K1618 ②			② Dual Sel. Diode
							③ Two Required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: TRUETONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N87 *	65X20	1N295	1N295	1N295	Video Det. (Pigtail)

* Some versions may use a 1N87A, CK-706A or 1N60 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	35A1179	VHF
M5	Tuner	35A1169	UHF
	Antenna Assy.	3-38A1054	Includes Handle (JFD Replacement Part #TA38)
	Dipole Antenna Assy.	9A2433-1	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

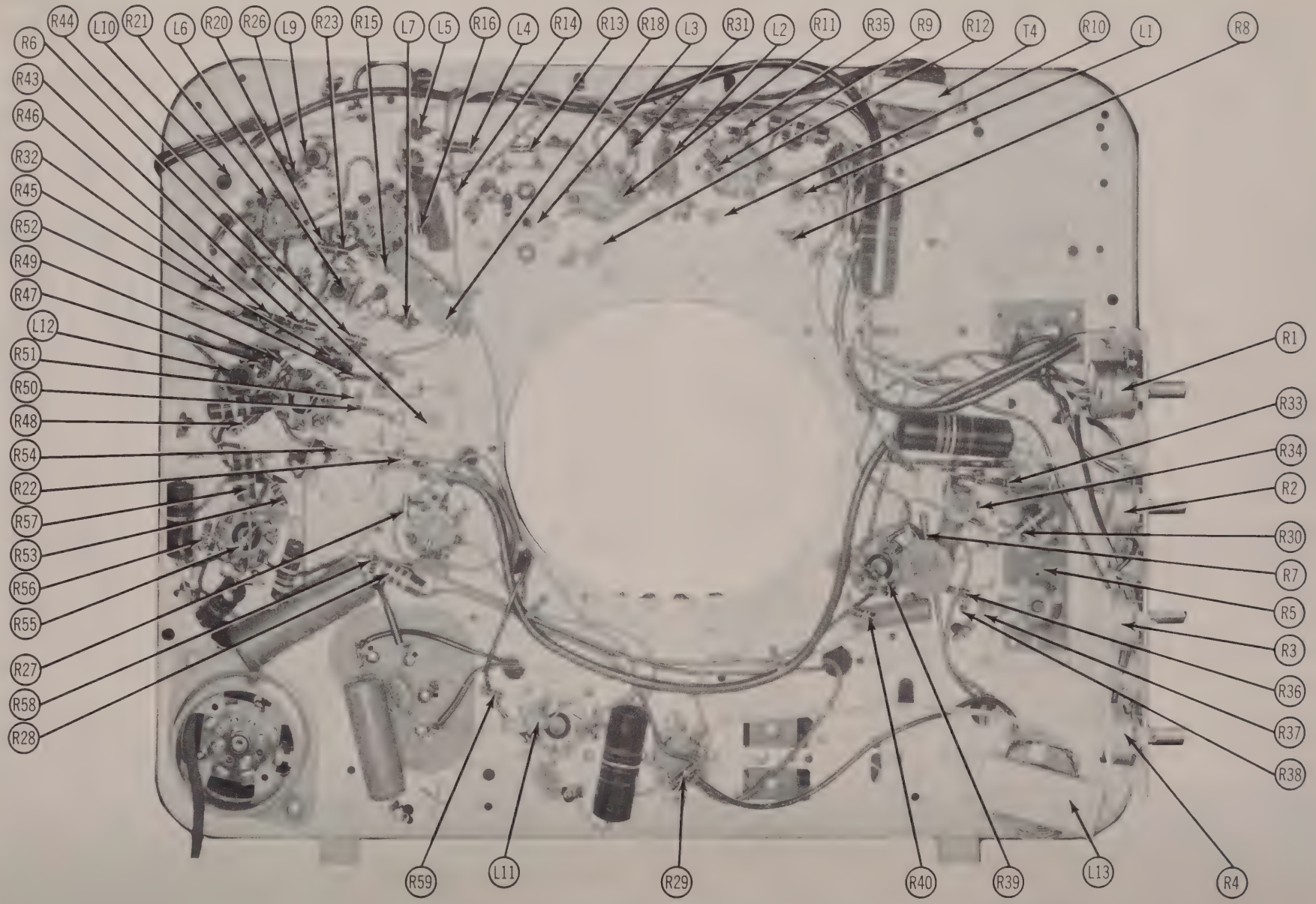
NAME	PART NO.	DESCRIPTION
Safety Glass	17X198	
Knob	10A836-1	Channel Selector
Knob	10A837-1	Fine Tuning
Knob	10A835-1	Off-On Volume, Brightness, Contrast, Vert. Hold
Cabinet Assy.	S-38A813	

WIRING DATA

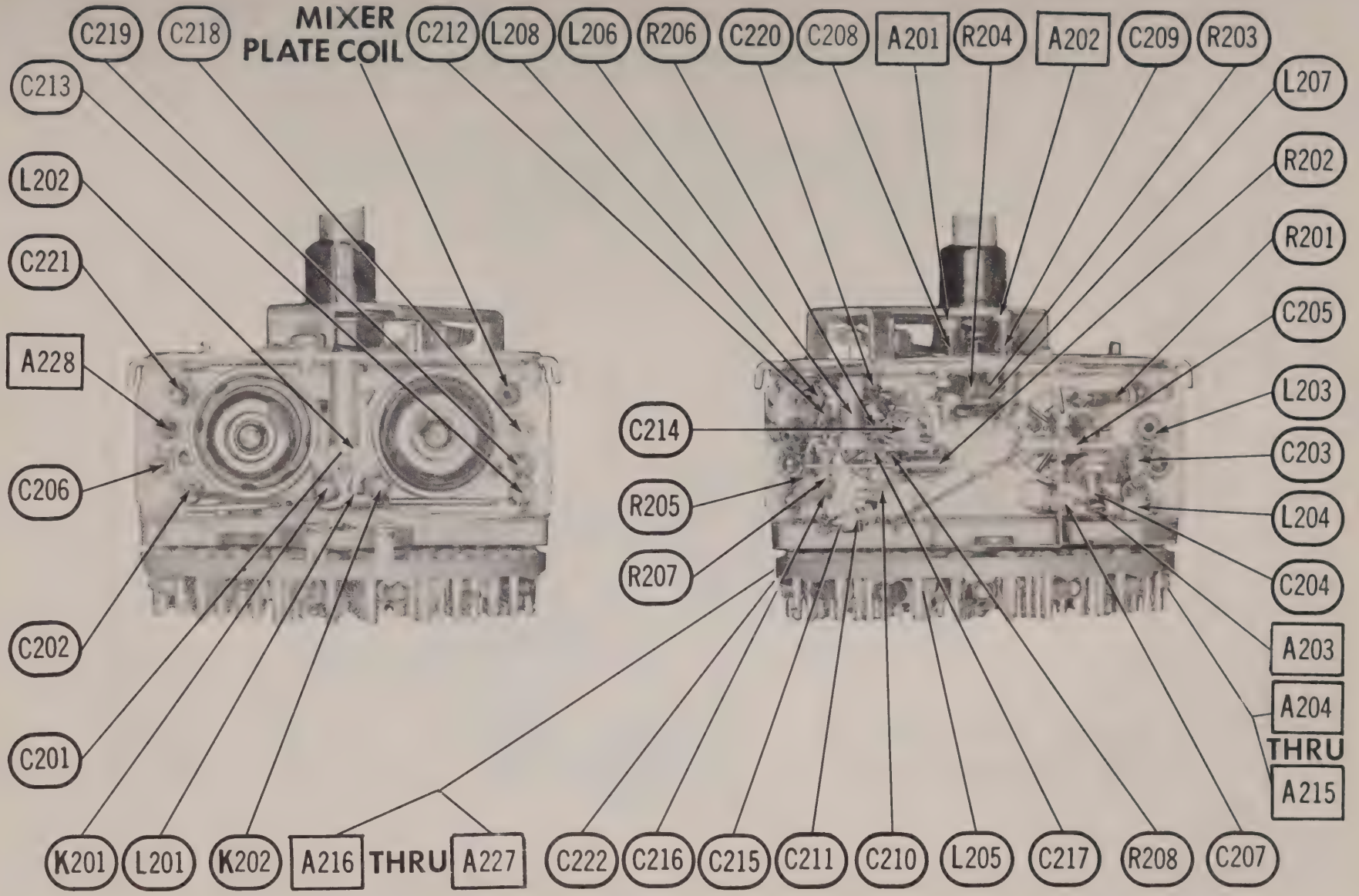
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TRUETONE MODEL 2DC3030A

FOLDER 2



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



TUNER 25A1179

MODEL 2DC3030A

TRUETONE

FOLDER 2

PAGE 11

TUNER PARTS LIST AND DESCRIPTIONS

25A1179

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	2BN4A	V202	Mixer-Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N3300 10%	#13L-031				**		
C202	30	#13M420U300J-01						
C203A	15 N150 7%	#13L8PG150N2				**		TCP-Q15
B	15 N150 7%					**		TCP-Q15
C204	2-10	#31B-206-08		829-10				
C205	47	#31M130U470J-01						
C206	1000		EF-001	MFT-1000		CCF-102	CT280A	
C207	.27	(.3mmf 10%)*						
C208	2-6			829-6		CV-3	CT552	
C209	2-6			829-6		CV-3	CT552	
C210	51 N750 10%		N750-DI 47	TCN-51	C10Q51U	CCTN-470	CN7-447	10TCC-Q50
C211	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C212	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C213	82 5%	#13M350F820J-01						
C214	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C215	13 5%			TCZ-12	C10Q13C	CCTO-120	CNO-412	10TCC-Q12
C216	4.7 ±.25mmf		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C217	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C221	1000		EF-001	MFT-1000		CCF-102	CT280A	
C222								

Standard Coil Part Numbers. * Alternate value (Part # 13D-111-42).
** Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	4700Ω	
R202	1000Ω	
R203	100K	
R204	220K	
R205	1000Ω	
R206	10K	
R207	15K	(5600Ω)*
R208	10K	

* Alternate value.

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Coil	31T-3397	
L202	RF Choke	34A-748	
L203	Trap Coil	34A-762	
L204	RF Choke	34A-1005	
L205	Ant., RF, Mixer Grid & Osc. Coils	31T-3361-07	Channel 2-13 Includes Rotor Assy.
L206	Fine Tuning Coil	34A-787-03	
L207	Fil. Choke	31K-137-027	
L208	Mixer Plate Coil	31UA-580-017	

NOTE: Part Numbers listed above are "Standard Coil" Part Numbers.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .3-1meg	13P-198-02	Centralab Sprague	RC-471 AC1-1
K202	Antenna Isolation	470mmf, .3-1meg	13P-198-02	Centralab Sprague	RC-471 AC1-1

NOTE: Part Numbers listed above are "Standard Coil" Part Numbers.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
	Fine Tuning Shaft & Cam Assy.	31T-3412-019	

NOTE: Part Number listed above is "Standard Coil" Part Number.

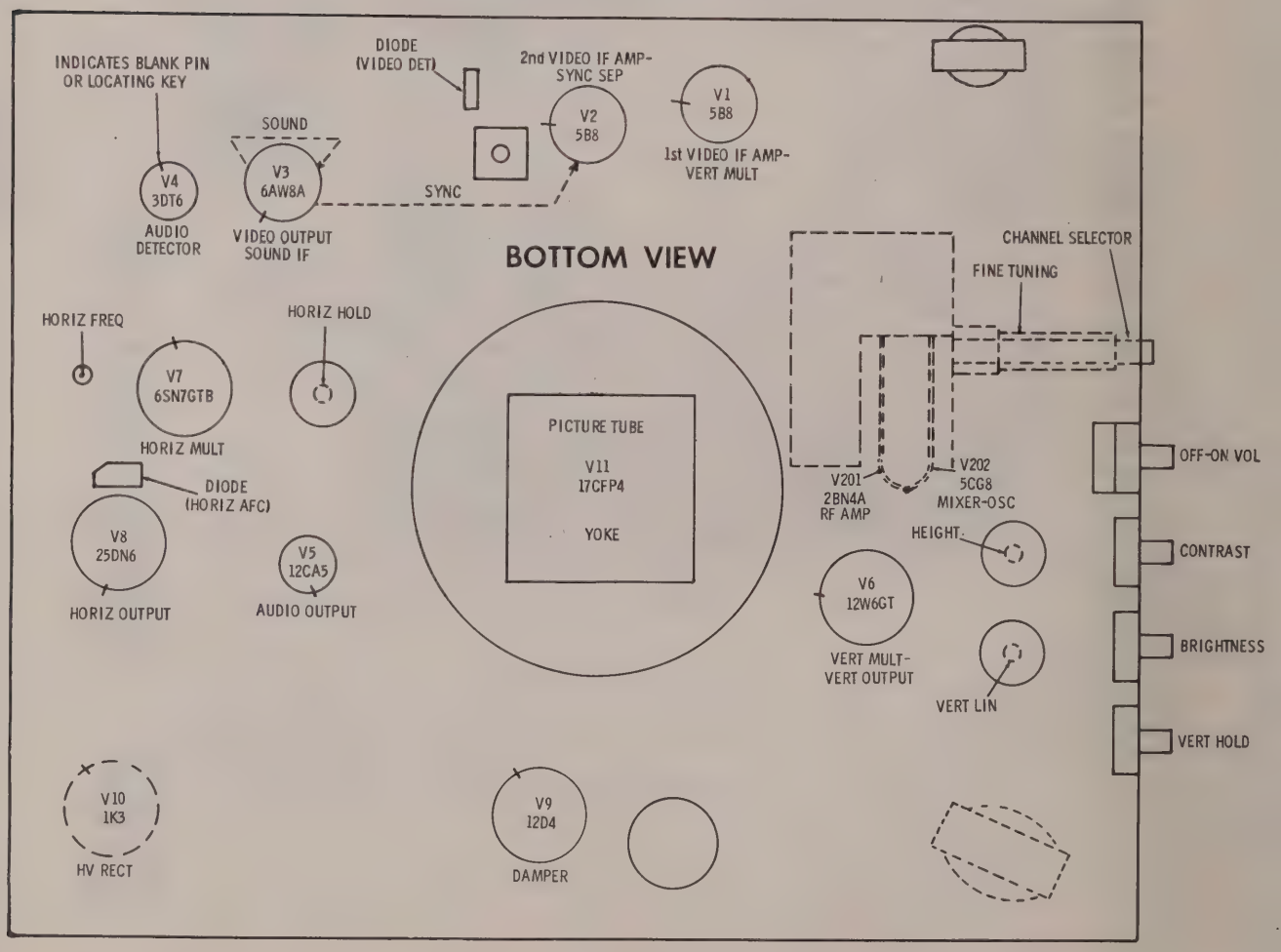
TRUETONE
MODEL 2DC3030A
CHASSIS - TOP VIEW

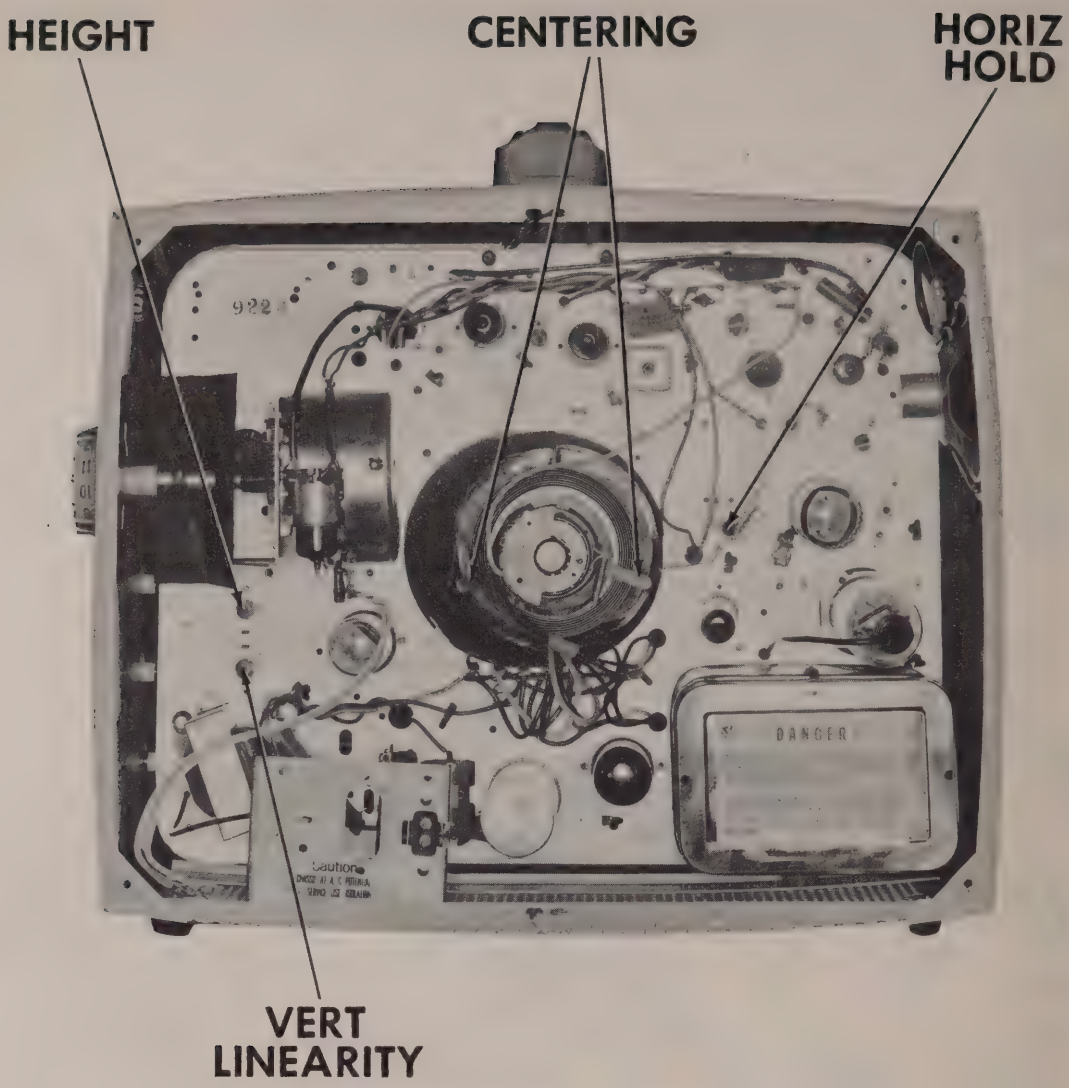
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5B8	0Ω	•1.2meg	•†2meg	11Ω	13Ω	1meg	56Ω	†150Ω	†150Ω
V2	5B8	0Ω	2.4meg	†9500Ω	9Ω	11Ω	.25Ω	180Ω	†150Ω	†150Ω
V3	6AW8A	0Ω	100K	†35K	7Ω	9Ω	•50Ω	1.5meg	†16Ω	†3300Ω
V4	3DT6	4.5Ω	680Ω	7Ω	6Ω	‡710K	†2200Ω	680K		
V5	12CA5	120Ω	NC	23Ω	19Ω	0Ω	†2200Ω	†230Ω		
V6	12W6GT	TP	15Ω	†265Ω	†16Ω	• 2.3meg	TP	19Ω	0Ω	
V7	6SN7GTB	3meg	†12K	1200Ω	• 100K	†47K	1200Ω	4.5Ω	6Ω	
V8	25DN6	TP	23Ω	0Ω	TP	435K	TP	30Ω	†1200Ω	TOP CAP †13Ω
V9	12D4	NC	TP	¶550K	NC	†16Ω	NC	0Ω	3Ω	
V10	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †447Ω
V11	17CFP4	3Ω	12Ω	Pin 6 †27K	Pin 10 †27K	Pin 11 •170K	Pin 12 4.5Ω			
V201	2BN4A	0Ω	1meg	15Ω	14.5Ω	†1200Ω	0Ω	1meg		
V202	5CG8	10K	†15K	0Ω	13Ω	14.5Ω	†1200Ω	†10K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 130V SOURCE.
‡ MEASURED FROM PIN 3 OF V9.
NC NO CONNECTION
TP TIE POINT

TUBE PLACEMENT CHART





CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the Horizontal Hold to the center of its range.

Tune in a TV station and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

Proper adjustment is indicated when it is possible to switch from one channel to another without the picture losing sync.

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PRODUCTION CHANGE BULLETIN 233

PRODUCTION CHANGE BULLETIN 233

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 435	
	Motorola Models Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y) were covered in PHOTOFACT Folder 1 - Set 435. Models Y21K115BA, MA, WA, Y21K116BA, MA, MCA, WA, Y21T62MA, Y21T63BA, MA, WA, 21K99W, 21T57MO, 21T62MA (Ch. TS-551Y, WTS-551, Y) are added along with late production changes.
Ch. TS-551A-04	COMPONENTS ADDED A .005 capacitor and a 68K ½ watt resistor placed in parallel is added between pin 7 of V4A (8EB8) and the junction of L10 and R23. A K-unit (Part #24K744975) may be used on some models. COMPONENT CHANGE L11 is changed to Part #24K749669. L13 is changed to Part #24K749670. L14 is changed to Part #24K749669.
Ch. TS-551A-05	TO IMPROVE VIDEO CIRCUIT C6, C7 and L2 are omitted. C22 is omitted. C21 is relocated from the junction of C19 and C20 to the junction of L8 and L9. L7 is changed to Part #24K750722. TO INCREASE HORIZONTAL SIZE C68 is decreased from .0047 to .0039. C70 is increased from 390mmf to 680mmf. C72 is decreased from 470mmf to 390mmf. C78 is increased from 150mmf to 180mmf. C79 is increased from 150mmf to 180mmf. R77 is decreased from 82K to 39K. R83 is decreased from 8200Ω to 6800Ω.
TS-551A-06	COMPONENT CHANGE R21 and C17 are removed from pin 6 of V3 (3BZ6). Both still are connected to lug 4 of L7. A .001 capacitor is added between pin 6 of V3 (3BZ6) and the junction of C17 and R21. A 47K resistor is added from pin 6 of V3 (3BZ6) to the 240V source. C54 is changed from .0047mfd @ 200VDC to .007mfd @ 400VDC.

MOTOROLA MODELS Y21K115BA, MA, WA, Y21K116BA, MA, MCA, WA, Y21T62MA, Y21T63BA, MA, WA, 21K99W, 21T57MO, 21T62MA (CH. TS-551Y, WTS-551, Y)

PRODUCTION CHANGE BULLETIN 233

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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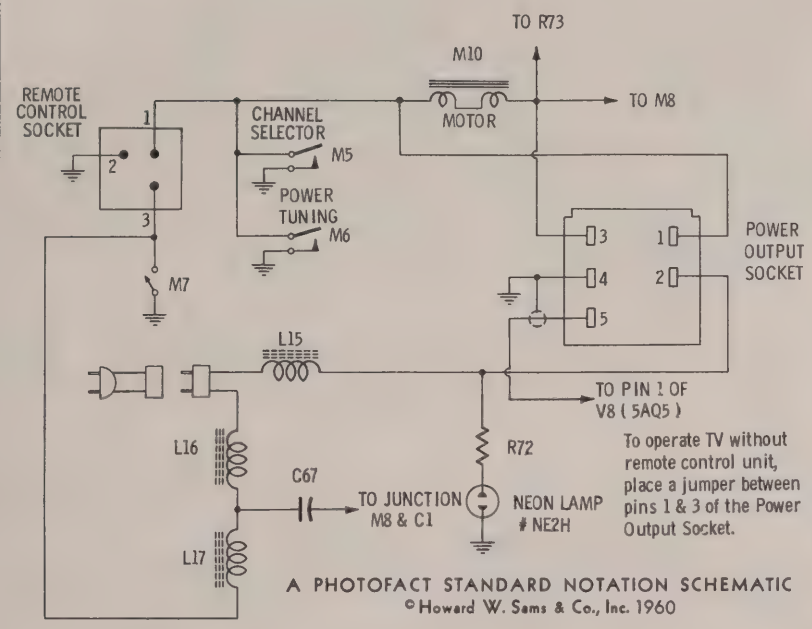
SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 461

Silvertone Models PC-160, -5, PC-162, -5, PC-164, -5, PC-180, -5, PC-182, -5, PC-184, -5, PC-186, -5, 160, -5, 162, -5, 164, -5, 180, -5, 182, -5, 184, -5, 186, -5 (Ch. 456.52200, 456.52201, 456.52202, 456.52203, 528.52200, 528.52201, 528.52202, 528.52203) were covered in PHOTOFACT Folder 2 - Set 461.

Models PC-161, -5, PC-163, -5, PC-165, -5, PC-181, -5, PC-183, -5, PC-185, -5, PC-187, -5, 161, -5, 163, -5, 165, -5, 181, -5, 183, -5, 185, -5, 187, -5 (CH. 456.52240, 456.52241, 456.52300, 456.52301, 528.52240, 528.52241, 528.52300, 528.52301) were added during late production.

The models and chassis added may incorporate a Remote Control Transmitter and Receiver (Ch. 456.52300, 456.52301, 528.52300, 528.52301). A schematic showing the Transmitter and Receiver is given on the reverse side.

When the Remote Transmitter and Receiver is used a new power output socket is added to the TV power supply. A partial schematic showing the new socket is given below in this bulletin.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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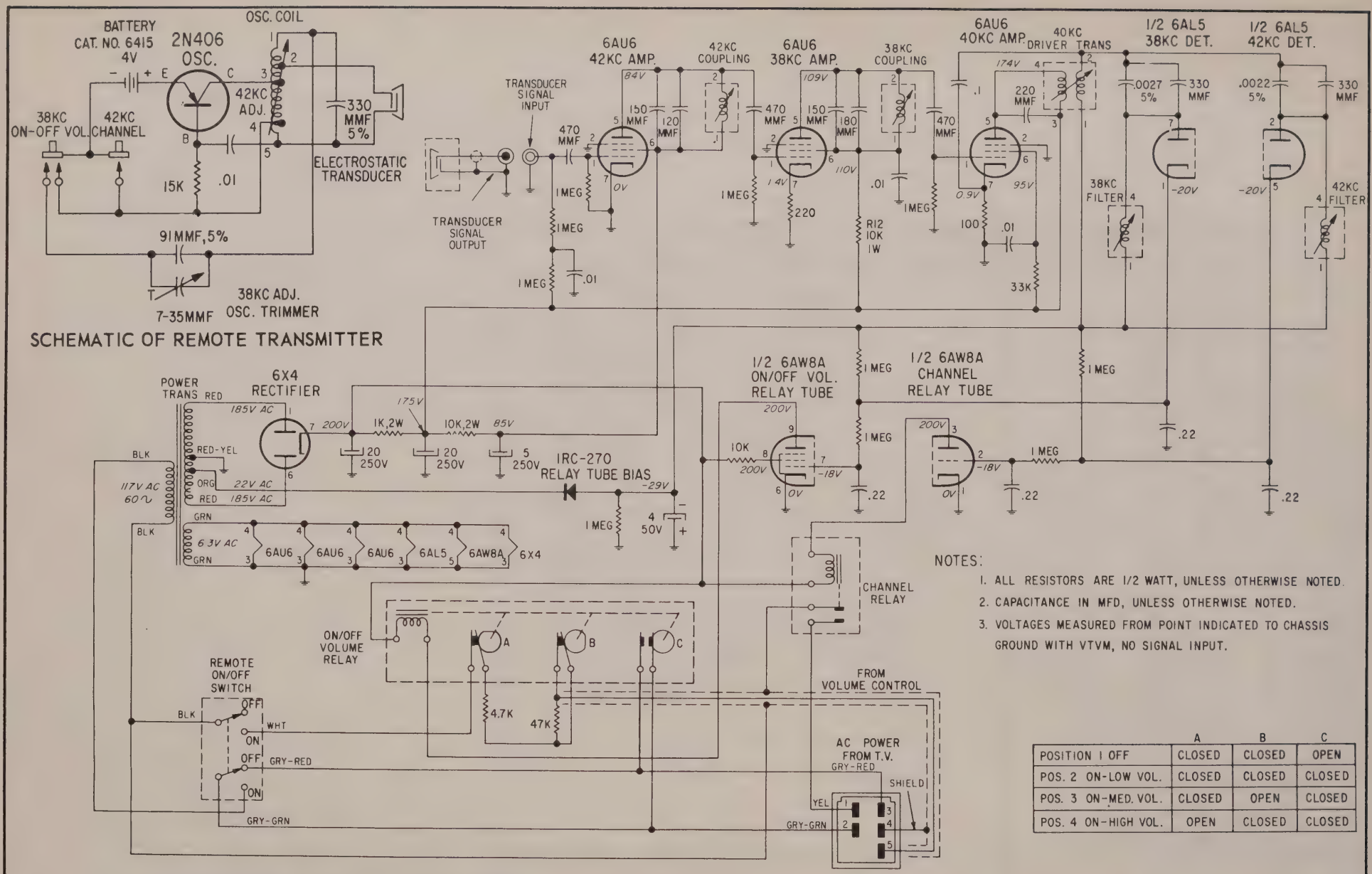
SILVERTONE MODELS PC-161, -5, PC-163, -5, PC-165, -5, PC-181, -5, PC-183, -5, PC-185, -5, PC-187, -5, 161, -5, 163, -5, 165, -5, 181, -5, 183, -5, 185, -5, 187, -5 (CH. 456.52240, 456.52241, 456.52300, 456.52301, 528.52240, 528.52241, 528.52300, 528.52301)



	A	B	C
POSITION 1 OFF	CLOSED	CLOSED	OPEN
POS. 2 ON-LOW VOL.	CLOSED	CLOSED	CLOSED
POS. 3 ON-MED. VOL.	CLOSED	OPEN	CLOSED
POS. 4 ON-HIGH VOL.	OPEN	CLOSED	CLOSED

SILVERTONE CHASSIS 456.52300, 456.52301, 528.52300, 528.52301

Schematic Diagram Courtesy of Sears, Roebuck & Co.

PHOTOFACT® Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ADMIRAL MODELS 742, 743 (Ch. 7Q1)

ADMIRAL MODELS
742, 743 (Ch. 7Q1)

MODEL 742

ADMIRAL MODELS
742, 743 (Ch. 7Q1)

TRADE NAME	Admiral Models 742, 743 (Ch. 7Q1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535 - 1620KC
RATING	9.5MA @ 9 Volts DC (No Signal, Min. Volume) 25MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	"	"	A5	"
3.		"	1400KC	Tune to 1400KC signal		A6	Adjust for maximum output while rocking tuning gang.

DISASSEMBLY INSTRUCTIONS

Note Viewed from rear, left side of chassis is held by two escutcheon flanges which (in some sets) are held by the chassis under these flanges.

1. Remove knobs
2. If used, remove two screws from cabinet bottom.
3. Unsnap rear cover. Remove battery case.
4. Remove two nuts from right corners of chassis. (Viewed from rear).
5. Hold front escutcheon and slide chassis to right. Remove chassis.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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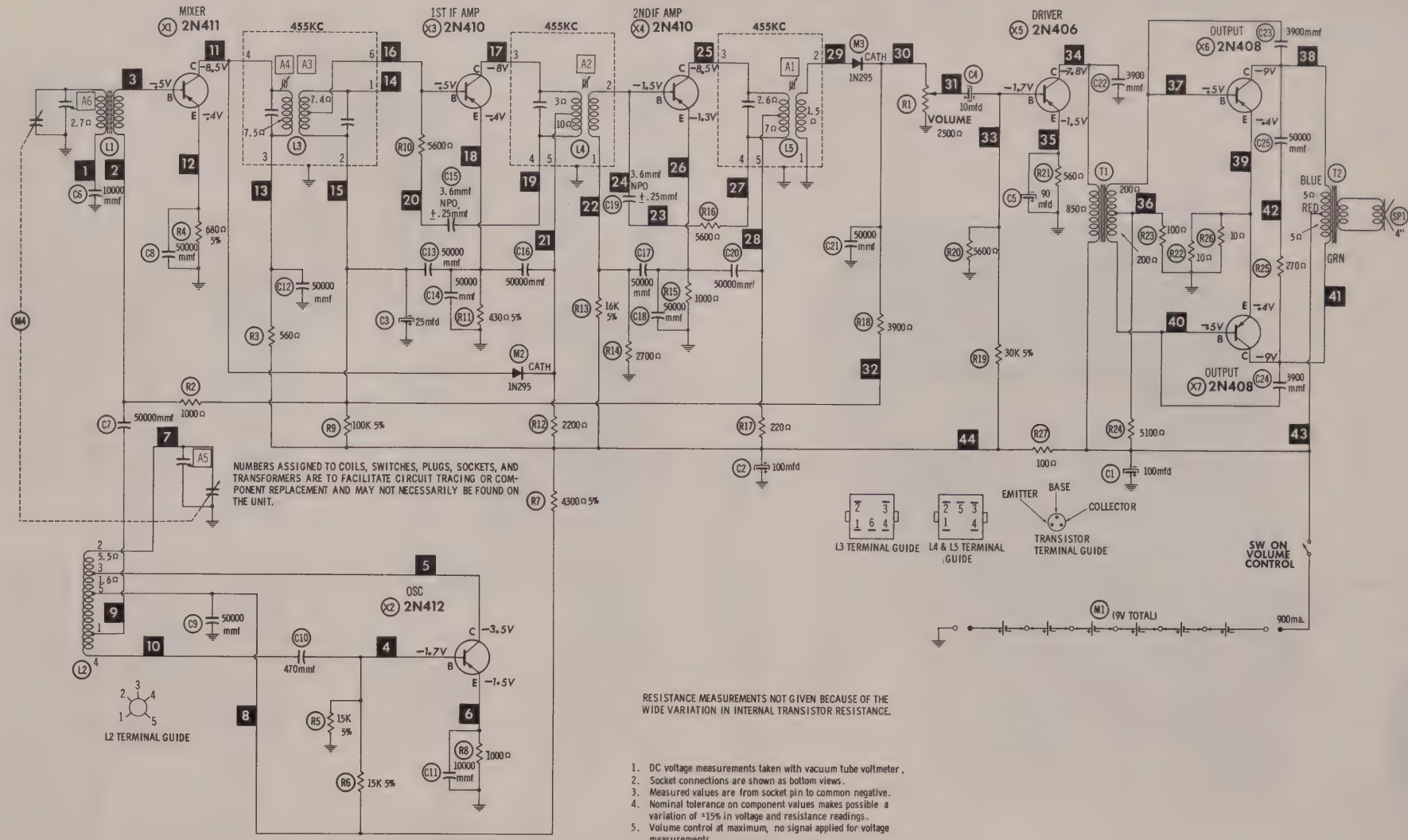

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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ADMIRAL MODELS
742, 743 (Ch. 7Q1)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N411	Mixer		2N411	2N486	2N411	PNP
X2	2N412	Oscillator		2N412		2N412	PNP
X3	2N410	1st IF Amplifier		2N410	2N483	2N410	PNP
X4	2N410	2nd IF Amplifier		2N410	2N483	2N410	PNP
X5	2N406	Driver		2N406	2N362	2N406	PNP
X6	2N408	Output		2N408	2N362	2N408	PNP } Matched
X7	2N408	Output		2N408	2N362	2N408	PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	12	67B32-6	BCD12100	ECPB417	PET1500	ML100-15	VL-1140	
C2	100	12	67B32-6	BCD12100	ECPB417	PET1500	ML100-15	VL-1140	
C3	25	3	67B32-13	BCD3025	ECPA11	PET1960	ML25-3	VL-1041	
C4	10	3	67B35-6	PWE3010	EC10-3	TT3X10	ML10-6	TE-1053	
C5	90	3	67B32-10	BCD3100	ECPB417	PET1400	ML100-3	VL-1051	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C8	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C9	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C10	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C13	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C14	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C15	3.6 NPO .25mmf	#65D10-190			C10V4C			10TCC-V39
C16	50000		BPD005	DD-503	H-05S5		TA-150	5HK-S50
C17	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C18	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C19	3.6 NPO .25mmf	#65D10-190			C10V4C			10TCC-V39
C20	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C21	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50
C22	3900		DI-4000	DD-392	L10D39	CCD-392	GP239	10TS-D39
C23	3900		DI-4000	DD-392	L10D39	CCD-392	GP239	10TS-D39
C24	3900		DI-4000	DD-392	L10D39	CCD-392	GP239	10TS-D39
C25	50000		BPD-05	DD-503	H-05S5		TA-150	5HK-S50

Admiral Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2500Ω	1/4	75B36-2					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

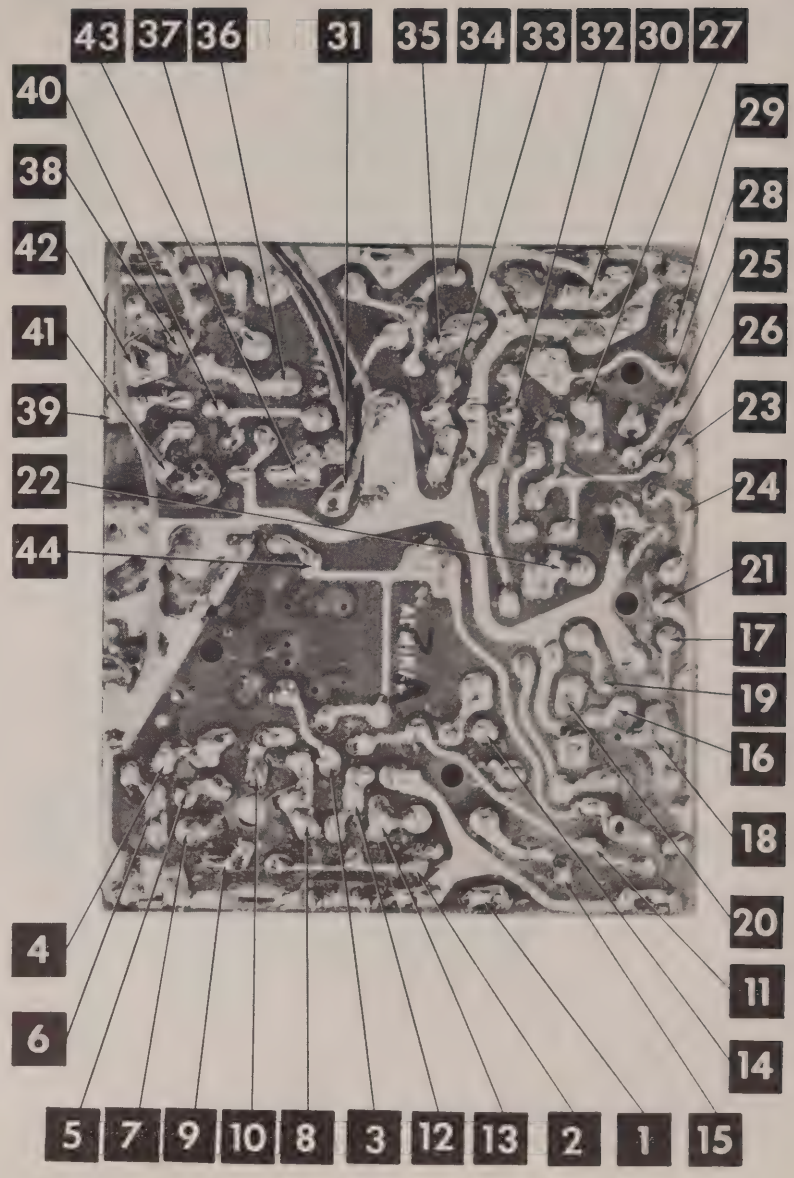
ITEM No.	RATING	REMARKS
R2	1000Ω	
R3	560Ω	
R4	680Ω 5%	
R5	15K 5%	
R6	15K 5%	
R7	4300Ω 5%	
R8	1000Ω	
R9	100K 5%	
R10	5600Ω	

ITEM No.	RATING	REMARKS
R11	430Ω 5%	
R12	2200Ω	
R13	16K	
R14	2700Ω	
R15	1000Ω	
R16	5600Ω	
R17	220Ω	
R18	3900Ω	
R19	30K 5%	

ITEM No.	RATING	REMARKS
R20	5600Ω	
R21	560Ω	
R22	10Ω	
R23	100Ω	
R24	5100Ω	
R25	270Ω	
R26	10Ω	
R27	100Ω	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	69B235-1						
L2	Osc. Coil	69A222-2						
L3	1st IF Trans.	72C189-3						
L4	2nd IF Trans.	72C190-1						
L5	3rd IF Trans.	72C190-2						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.2	1	79B76-1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	55Ω CT	3-4Ω	(Part of SP1)							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	78C156-3 ①	4A1	① Includes T2

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			1 ①		935 ①		M-14M①	① Six required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N295	1N295	1N60	1N295	1N295	AVC (Pigtail)
M3	1N295	1N295	1N60	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuning Cap.	68C66-11	2 Gang (Ant. 30-272.3mmf, Osc. 20-102.1mmf)

CABINETS & CABINET PARTS

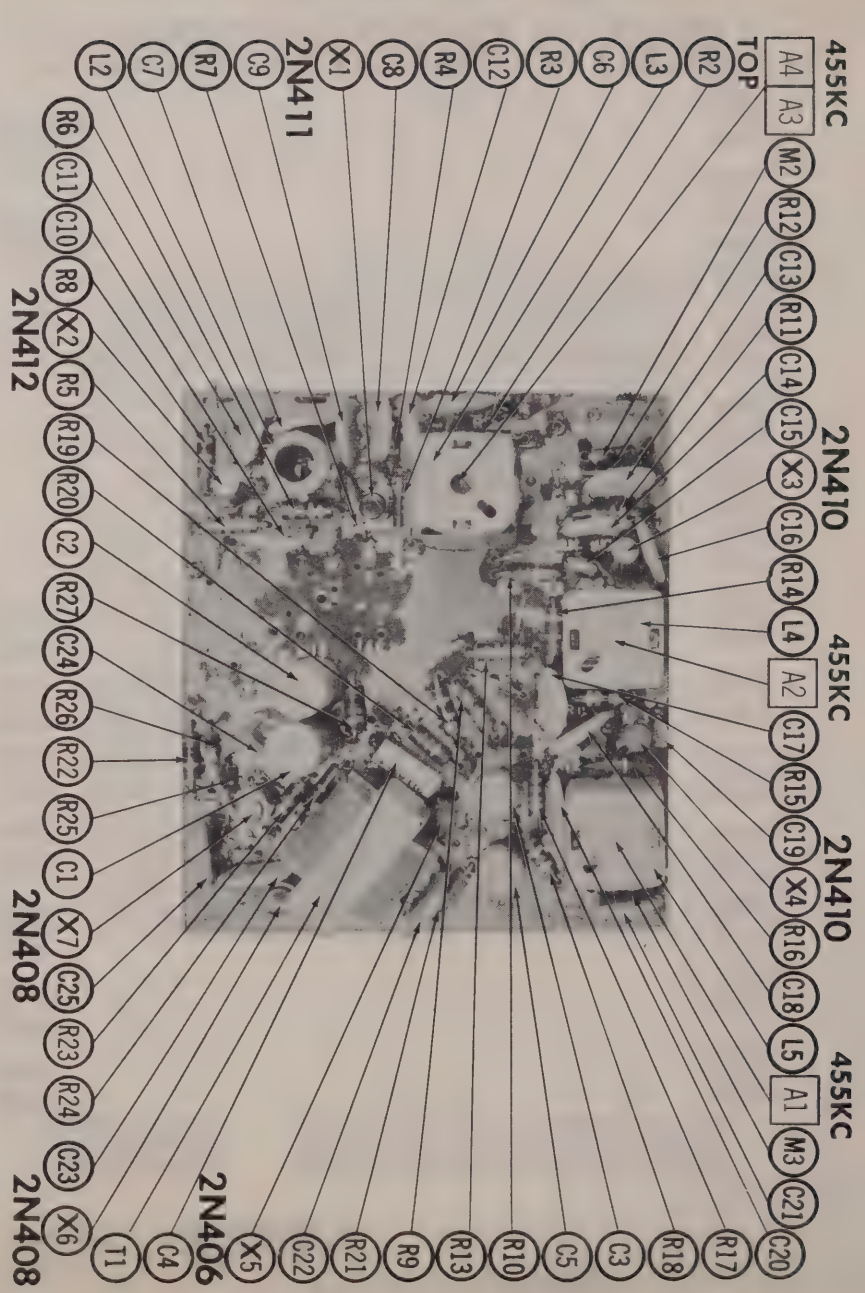
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33B314-1	Tuning
Knob	33B311-1	Volume
Cabinet	34D140-2	Red, Model 742
Cabinet	34D140-3	White, Model 742

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

ARVIN MODELS 5592, 5594
(Ch. 1.46800, 1.46900)

MODEL 5594

ARVIN MODELS 5592, 5594
(Ch. 1.46800, 1.46900)

TRADE NAME	Arvin Models 5592 (Ch. 1.46800), 5594 (Ch. 1.46900)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	AC Operated 5 Tube AM Receiver with Electric Clock
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	19 Watts, .22 Amp. @ 117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	535-1670KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4, A6.... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A7.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A6	"
4.		"	1400KC	Tune to 1400KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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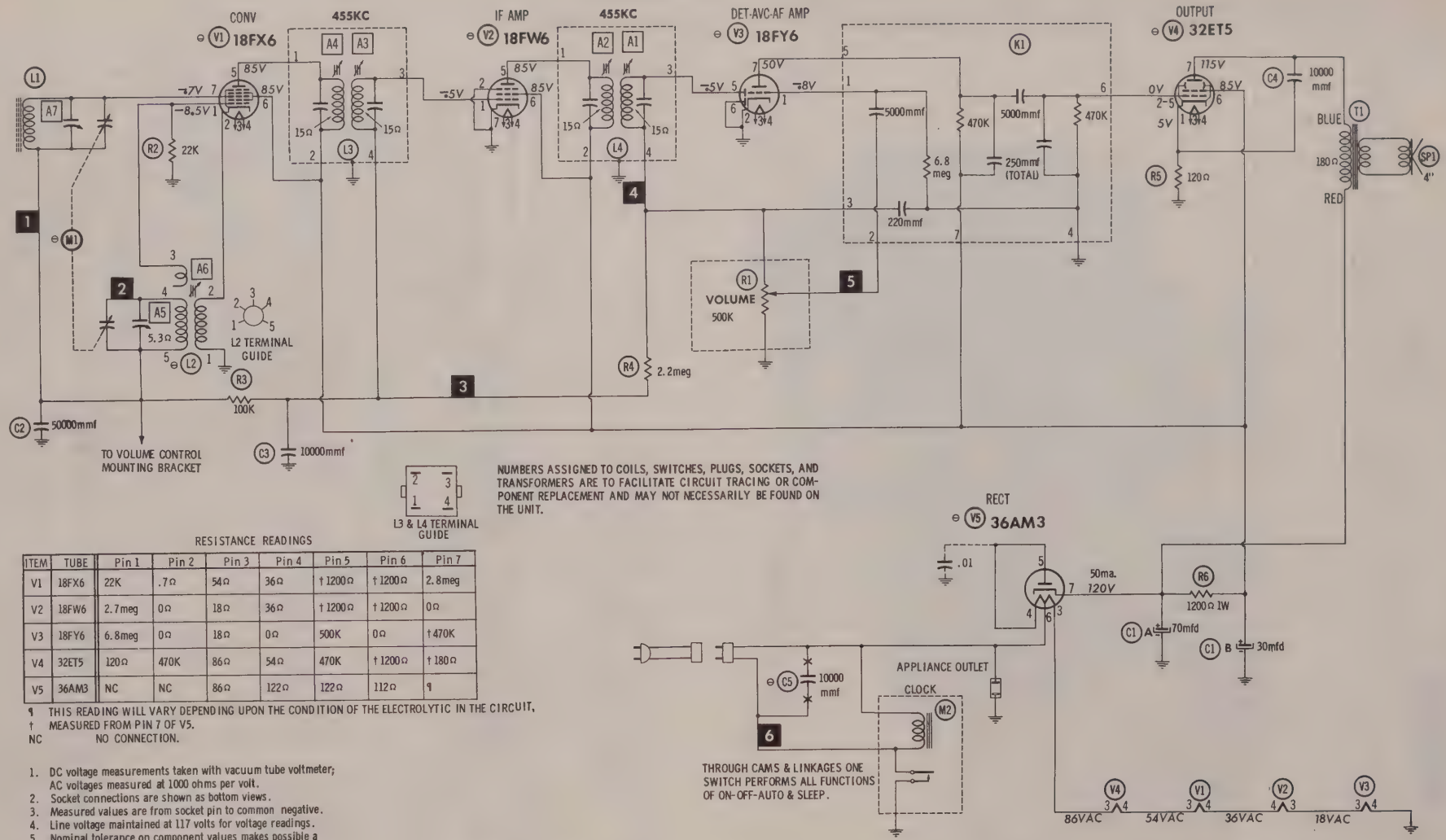
SET 474 FOLDER 5



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	18FX6	22K	.7Ω	54Ω	36Ω	†1200Ω	†1200Ω	2.8meg
V2	18FW6	2.7meg	0Ω	18Ω	36Ω	†1200Ω	†1200Ω	0Ω
V3	18FY6	6.8meg	0Ω	18Ω	0Ω	500K	0Ω	†470K
V4	32ET5	120Ω	470K	86Ω	54Ω	470K	†1200Ω	†180Ω
V5	36AM3	NC	NC	86Ω	122Ω	122Ω	112Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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ARVIN MODELS 5592, 5594
(Ch. 1.46800, 1.46900)

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •		GENERAL ELECTRIC •		• RAYTHEON •		• SYLVANIA •	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE	
V1	Converter	18FX6	(12BE6)*	V4	Output	32ET5	(50C5)*
V2	IF Amplifier	18FW6	(12BA6)*	V5	Rectifier	36AM3	(35W4)*
V3	Det. -AVC-AF Amp.	18FY6	(12AV6)*				

* Used in Model 5592.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	70	150	44328-5	PR2-040	BBRD8415	WD220			
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	50000		BPD-05	DD-503	CUB6S5	6DP-3-503	GP150	5HK-S50
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C5	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	45250-5					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	22K	
R3	100K	

ITEM No.	RATING	REMARKS
R4	2.2meg	
R5	120Ω	

ITEM No.	RATING	REMARKS
R6	1200Ω 1W	

COMPONENT COMBINATIONS

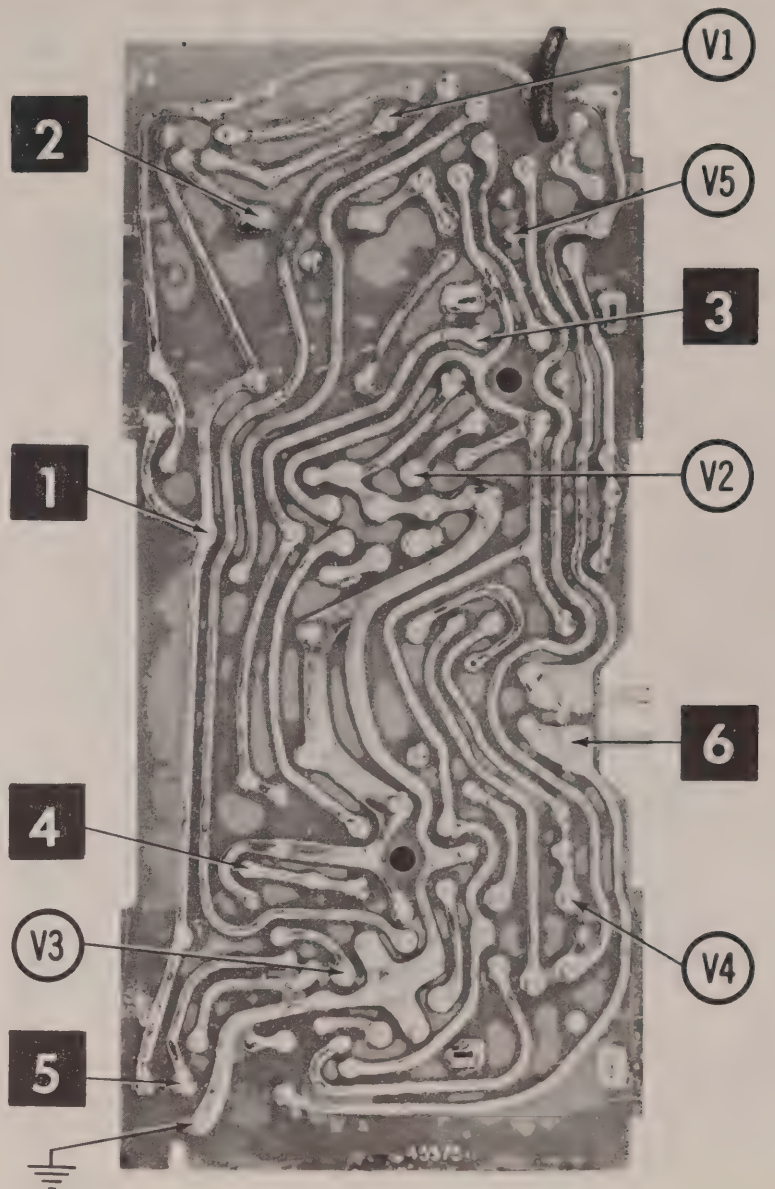
ITEM No.	USE	DESCRIPTION	ARVIN PART No.	REPLACEMENT DATA	
K1	Audio Coupling	(2) 125mmf, 220mmf, (2) 5000mmf (2) 470K, 6.8meg	43743-2	Aervox Centralab Mallory Sprague	PA-512-3 PC-158 MS-107 * DT-5

* Reverse leads 5 and 6.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ARVIN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	46568-1						
L2	Osc. Coil	43644-1 †						
L3	Input IF	44282-1	16-6780	16-6780	BC-356	13-PC9	RF-4	
L4	Output IF	44282-1	16-6780	16-6780	BC-357	13-PC10	RF-4	

† Model 5592 used Part #43644-8 in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2200Ω	3-4Ω	46700-2	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	46834-1	4A07	

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Tuning Cap.	46885	2 Gang, Model 5594
	Tuning Cap.	46175	2 Gang, Model 5592
M2	Clock	46551-061	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

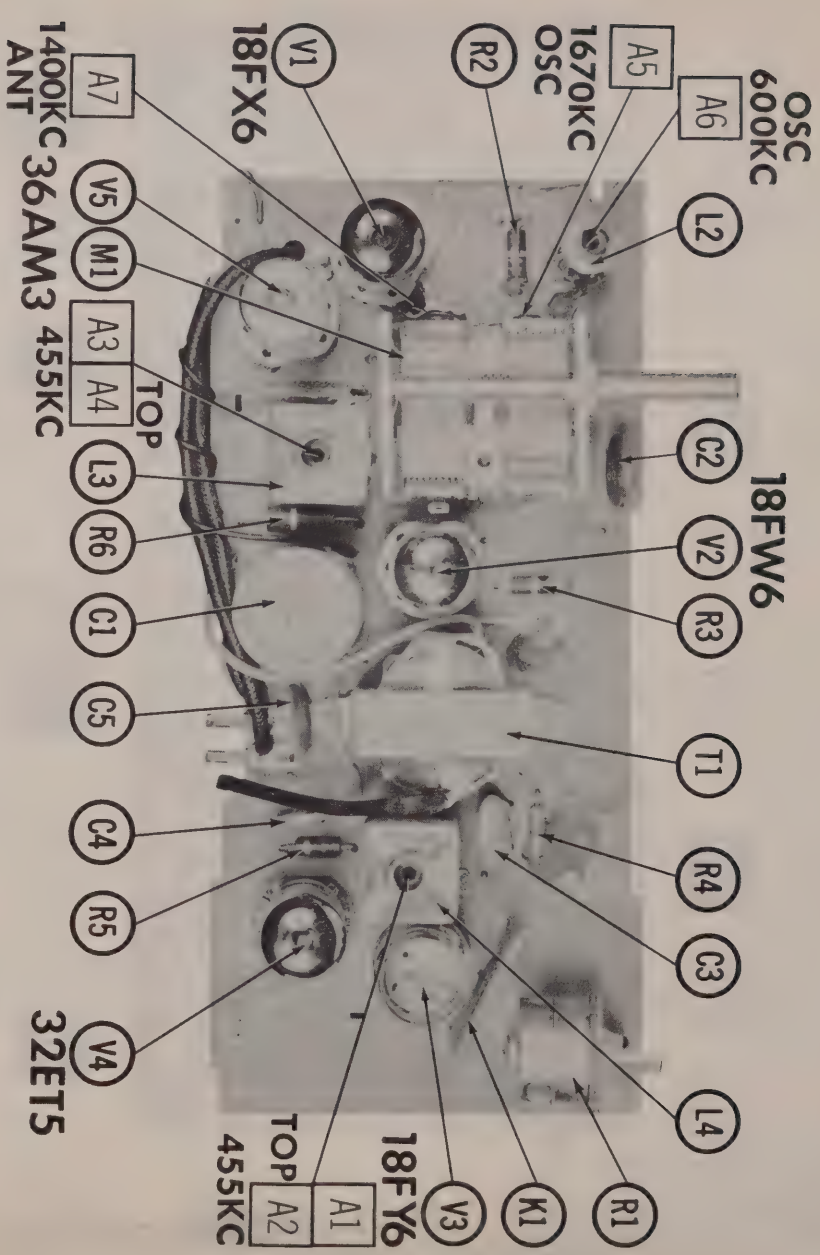
NAME	PART NO.	DESCRIPTION
Knob	46843	Tuning, Model 5594
Knob	46550-67	Tuning, Model 5592
Knob	46844	Volume, Model 5594
Knob	45965-67	Volume, Model 5592
Knob	44646	Clock, Models 5594, 5592
Clock Crystal	46842	Model 5594
Clock Crystal	46527	Model 5592
Clock Hand	47109-11	Hour, Model 5594
Clock Hand	56540-11	Hour, Model 5592
Clock Hand	47108-11	Minute, Model 5594
Clock Hand	46541-11	Minute, Model 5592
Clock Hand	47111-99	Second, Model 5594
Clock Hand	46542-33	Second, Model 5592
Clock Hand	47110-99	Alarm Set, Model 5594
Clock Hand	46543-29	Alarm Set, Model 5592
Pointer	46845	Model 5594
Cabinet Back	46552-132	Pink, Model 5594
Cabinet Back	46552-852	Blue, Model 5594
Cabinet Back	46552-861	Green, Model 5592
Cabinet Back	46552-671	Ivory, Model 5592
Cabinet Front	46837-673	Pink, Model 5594
Cabinet Front	46837-675	Blue, Model 5594
Cabinet Front	46548-67	Ivory, Model 5592

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW

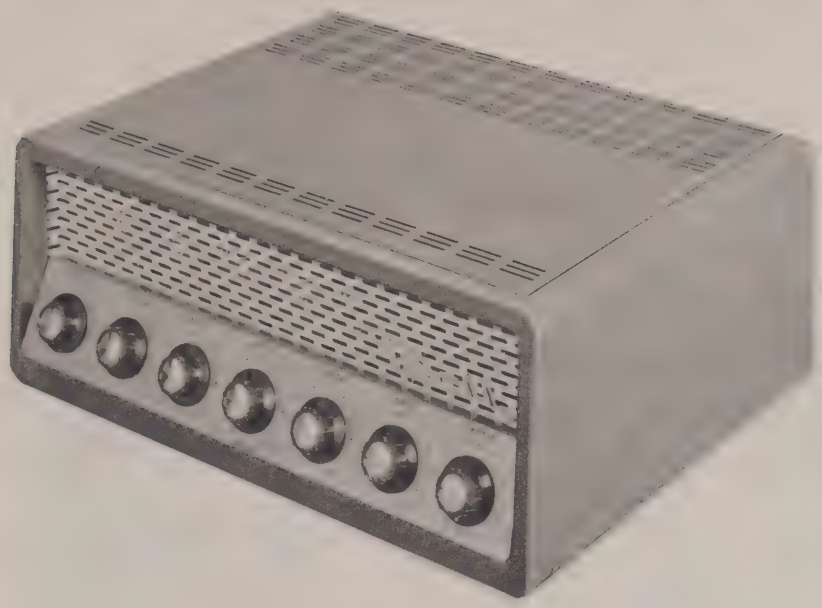


PHOTOFACT® Folder

EIA MEMBER

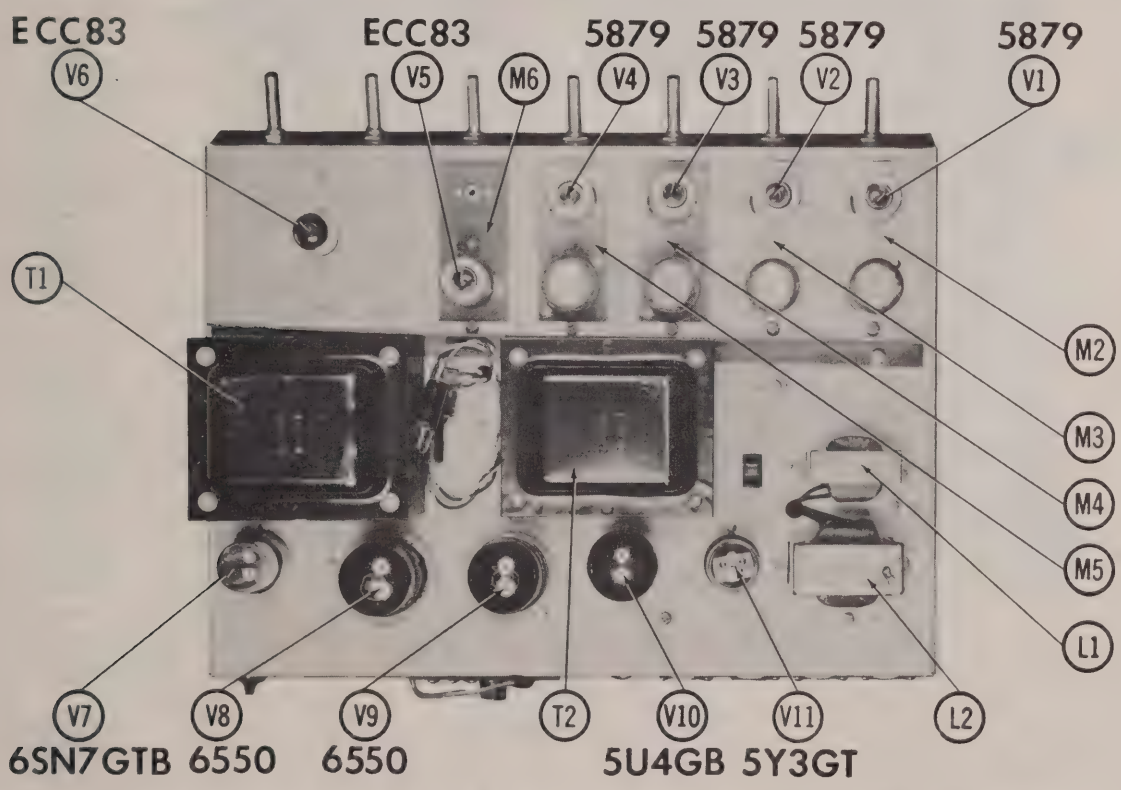
BELL SOUND MODEL 5650

BELL SOUND
MODEL 5650



TRADE NAME	Bell Sound Model 5650
MANUFACTURER	Bell Sound Div., Thompson Ramo Wooldridge Inc., 555 Marion Road, Columbus 7, Ohio
TYPE SET	AC Operated 11 Tube 5 Channel Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 210 Watts, 2 Amp. @ 117 Volts AC

BELL SOUND
MODEL 5650



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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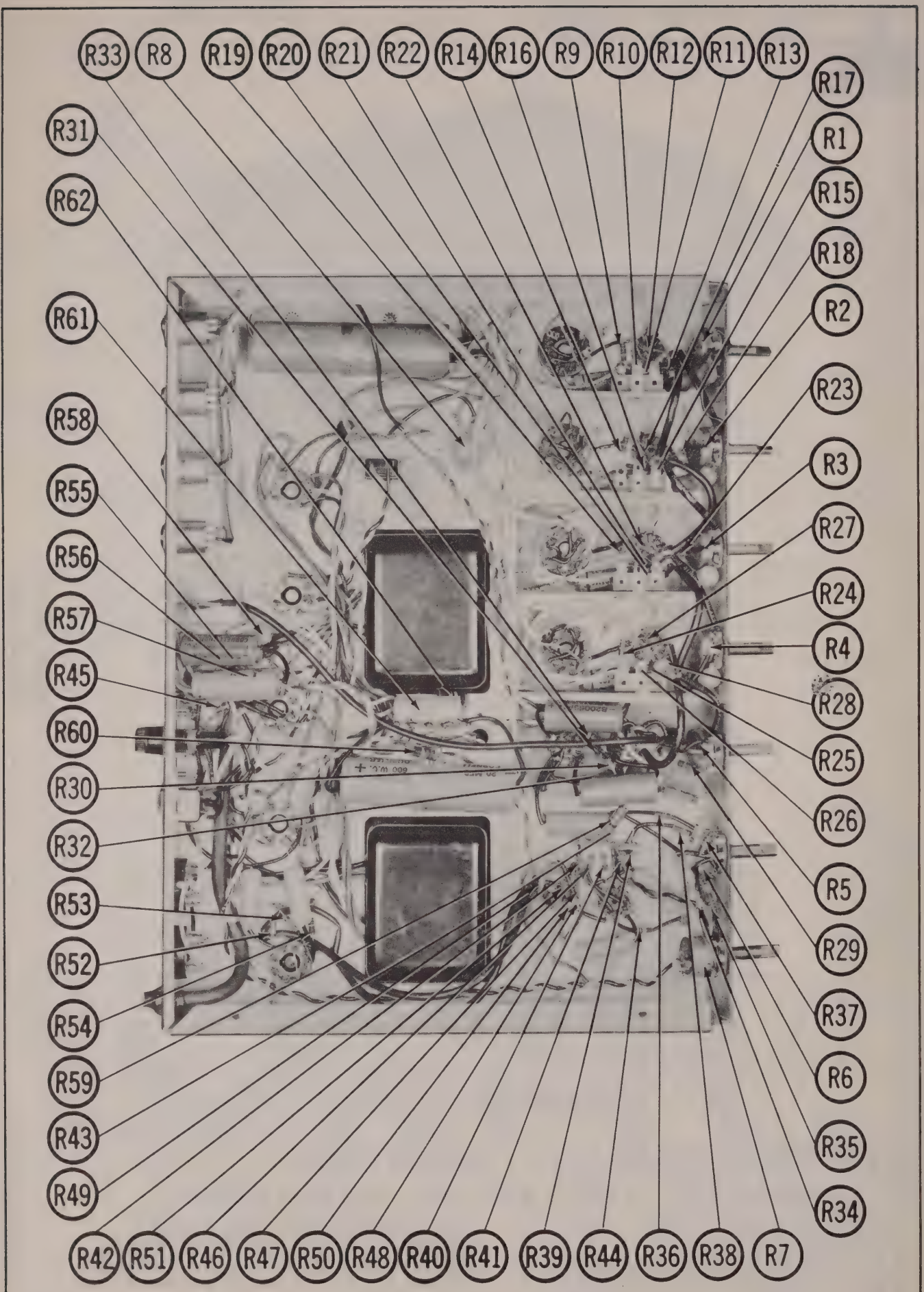


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Mic 1 Preamplifier	5879	V7	AF Amplifier	6SN7GTB
V2	Mic 2 Preamplifier	5879	V8	Output	6550
V3	Mic 3 Preamplifier	5879	V9	Output	6550
V4	Mic 4 Preamplifier	5879	V10	Rectifier	5U4GB
V5	Phono Preamp. - AF Amp.	ECC83/12AX7	V11	Rectifier	5Y3GT
V6	AF Amp. - Phase Inv.	ECC83/12AX7			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BELL SOUND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	20	600	B20053P149	PRS1890	BRVH620		TD-20-600	TVA-1966	
C2A	20	450	B20053P150	PR4-175	BBRQ222245	WQ795	CDB-Q-4422	TVA-4750	
B	20	450							
C	20	450							
D	20	450							
C3	50	50	B20053P156	PRS1350	BR505	TC39	TD-50-50	TVA-1308	
C4	150	15	B20053P14	PRS1370	BR1505	TC25015	TD-150-50	TVA-1311	
C5	150	15	B20053P14	PRS1370	BR1505	TC25015	TD-150-50	TVA-1311	
C6	150	15	B20053P14	PRS1370	BR1505	TC25015	TD-150-50	TVA-1311	

FIXED CAPACITORS

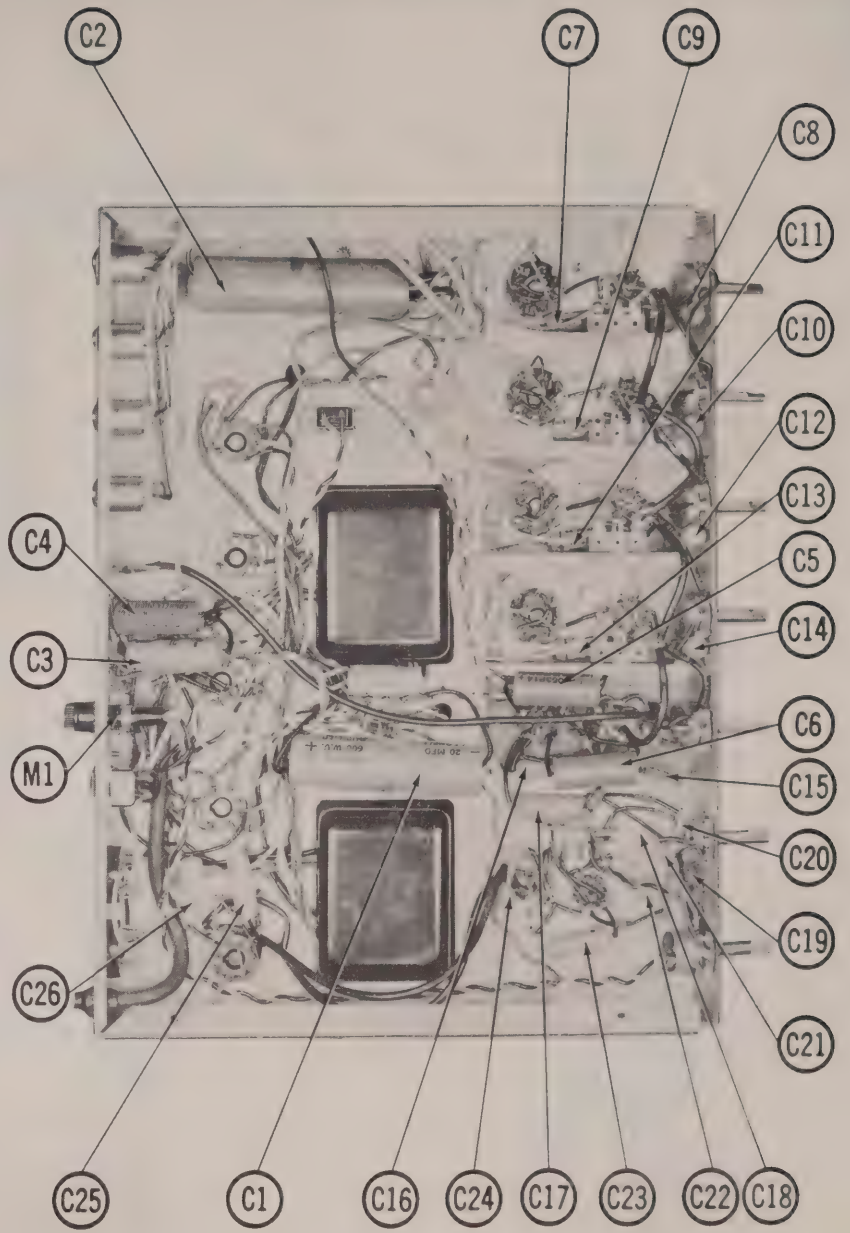
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C8	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C9	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C10	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C11	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C12	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C13	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C14	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C15	47 10%		1469-00047	DD-471	5R5T47	CM-20B-471M	MCJ244	MS-347
C16	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C18	560 10%		1469-00056	DD-561	1R5T56	CM-20B-561K	MCJ247	MS-356
C19	.006 400V		P488N-006	DD16-602	CUB6D6	6DP-1-602	GEM-626	6TM-D6
C20	.004 400V		P488N-004	DD-402	CUB6D4	6DP-1-402	GEM-624	6TM-D4
C21	330 10%		1469-00033	DD-331	5R5T33	CM-20B-331K	MCB241	MS-330
C22	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C23	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C24	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C25	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C26	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BELL SOUND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250K	½	B20066P145	B-51	A47-250K-Z	Q13-130	U44	Mic 1
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	250K	½	B20066P145	B-51	A47-250K-Z	Q13-130	U44	Mic 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	250K	½	B20066P145	B-51	A47-250K-Z	Q13-130	U44	Mic 3
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	250K	½	B20066P145	B-51	A47-250K-Z	Q13-130	U44	Mic 4
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K	½	B20066P142	B-60	A47-500K-Z	Q13-133	U48	Phono
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	2meg	½	B20066P147	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R7A	1meg	½	B20066P146	B-70-S	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-13	76-1	US-26	Power Off-On
R8A	100Ω	2(WW)	B20066P141	WN-101	A43-100	WPK-100	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R9	2.2meg	
R10	150K	
R11	75K 5%	
R12	15K 5%	
R13	150K 5%	
R14	2.2meg	
R15	150K	
R16	75K 5%	
R17	15K 5%	
R18	150K	
R19	2.2meg	
R20	150K	
R21	75K 5%	
R22	15K 5%	
R23	150K	
R24	2.2meg	
R25	150K	
R26	75K 5%	

ITEM No.	RATING	REMARKS
R27	15K 5%	
R28	150K	
R29	1.2meg	
R30	150K	
R31	8200Ω	
R32	180K	
R33	2700Ω	
R34	27K	
R35	27K	
R36	15K 5%	
R37	220K	
R38	120K 5%	
R39	47K	
R40	150K	
R41	3300Ω	
R42	1.2meg	
R43	150K	
R44	68K	

ITEM No.	RATING	REMARKS
R45	3.9meg	
R46	150K	
R47	2700Ω	
R48	100K	
R49	430K 5%	
R50	100K	
R51	430K 5%	
R52	100K	
R53	100K	
R54	1500Ω	
R55	220K	
R56	220K	
R57	180Ω 1W	
R58	80Ω 5W	
R59	10K 1W	
R60	8200Ω 1W	
R61	3900Ω 7W	
R62	100K 2W	
R63	1.2meg	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1	.250A	110Ω	4.5 Hy.	B20303						
L2	.030A	500Ω	15 Hy.	B20302	20C46 ①	C-2987 ①		C1003 ①	20C46 ①	C-5X ①

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 2A	1200VCT @ .250A	780VCT @ .030A	B20301						
	SEC. 3	SEC. 4	SEC. 5							
	5V @ 3A	5V @ 2A	6.3V @ 5.3A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4800Ω CT	500Ω Taps @ 70V, 16Ω, 8Ω, 4Ω	B20300							

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BELL SOUND PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 125V S/B	B-20043P23	B-20001P13	313003 (3AG 3A 125V S/B)	342001	MDX3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	BELL SOUND PART No.	NOTES
M2	Module Assembly	15B0356	Preamplifier, Microphone 1
M3	Module Assembly	15B0356	Preamplifier, Microphone 2
M4	Module Assembly	15B0356	Preamplifier, Microphone 3
M5	Module Assembly	15B0356	Preamplifier, Microphone 4
M6	Module Assembly	15B0355	Phono and Mixer

CABINETS & CABINET PARTS

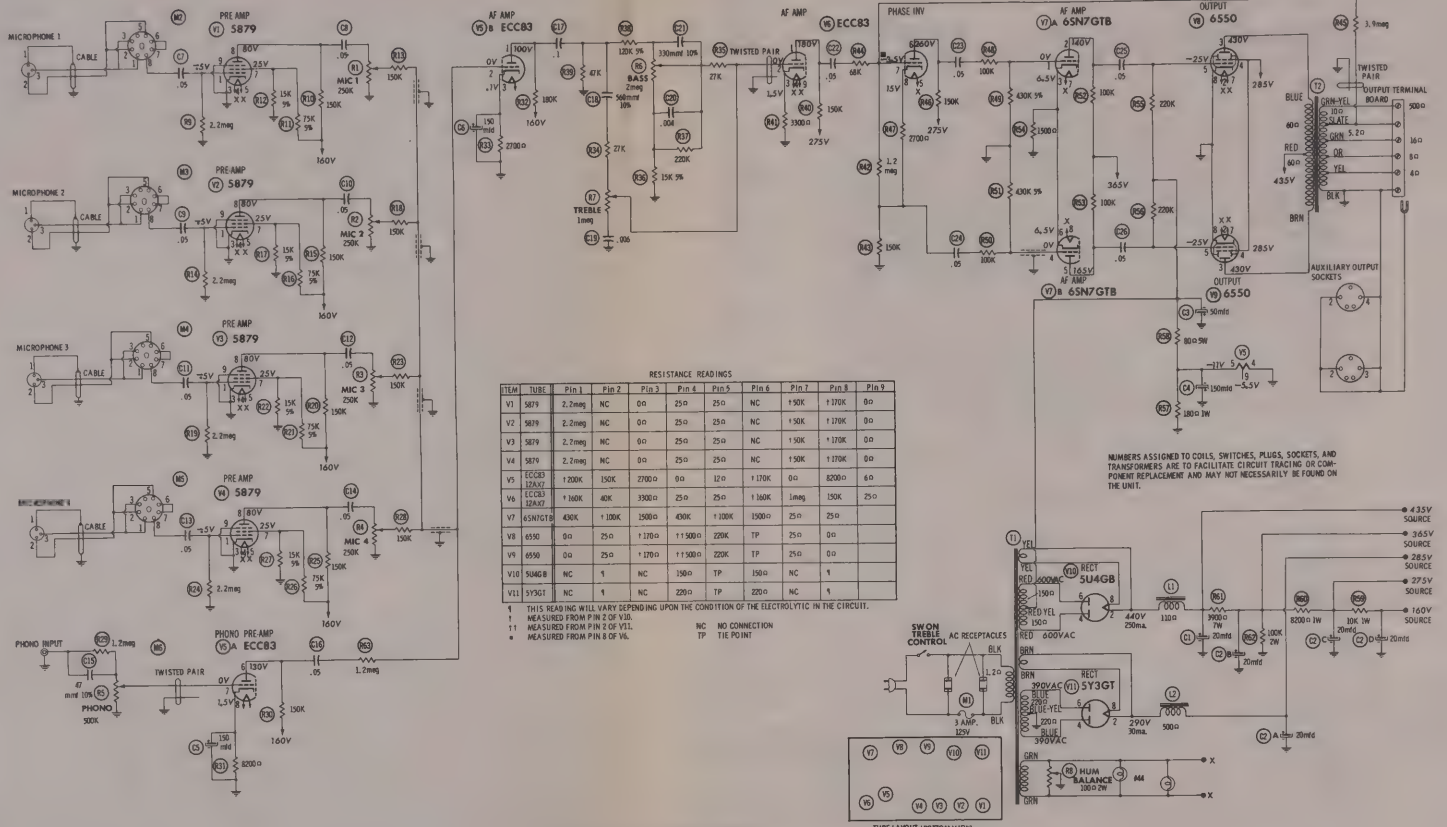
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	B-20148P53	Phono, Bass, & Treble, Microphone

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	2.2meg	NC	0Ω	25Ω	25Ω	NC	↑50K	↑170K	0Ω
V2	5879	2.2meg	NC	0Ω	25Ω	25Ω	NC	↑50K	↑170K	0Ω
V3	5879	2.2meg	NC	0Ω	25Ω	25Ω	NC	↑50K	↑170K	0Ω
V4	5879	2.2meg	NC	0Ω	25Ω	25Ω	NC	↑50K	↑170K	0Ω
V5	ECC83 12AX7	↑200K	150K	2700Ω	0Ω	12Ω	↑170K	0Ω	8200Ω	6Ω
V6	ECC83 12AX7	↑160K	40K	3300Ω	25Ω	25Ω	↑160K	1meg	150K	25Ω
V7	6SN7GTB	430K	↑100K	1500Ω	430K	↑100K	1500Ω	25Ω	25Ω	
V8	6550	0Ω	25Ω	↑170Ω	↑↑500Ω	220K	TP	25Ω	0Ω	
V9	6550	0Ω	25Ω	↑170Ω	↑↑500Ω	220K	TP	25Ω	0Ω	
V10	5U4GB	NC	¶	NC	150Ω	TP	150Ω	NC	¶	
V11	5Y3GT	NC	¶	NC	220Ω	TP	220Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 2 OF V3B.
↑↑ MEASURED FROM PIN 2 OF V11.
∗ MEASURED FROM PIN 8 OF V6.

NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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BELL SOUND MODEL 5650

PHOTOFACT® Folder

**COLUMBIA
MODEL 623**

COLUMBIA
MODEL 623

COLUMBIA
MODEL 623

TRADE NAME	Columbia Model 623
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 28 Watts, .32 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT484

DATE 2 — 60 SET 474 FOLDER 7

SET 474 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A AF Amp. - Channel B AF Amp.	12AX7	V2 V3	Channel A Output Channel B Output	50C5 50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	11B713	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150							
C	20	150							
C2	50	25	11B729	SRE25V50	BBR50-25	TC29	TD-50-25	TVA-1206	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-6222	6TM-D2
C4	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-6222	6TM-D2
C5	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	270		BPD-00027	DD-271	L10T27	CCD-271	B-327	5GA-T27
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C11	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	270		BPD-00027	DD-271	L10T27	CCD-271	B-327	5GA-T27
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C16	.47 400V		P488N-47		CUB4P47		GEM-4047	4TM-P47
C17	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C18	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3meg	1/2	9B604	B-85		Q13-140	■ UE3971	Volume, Channel A
B	3meg	1/2		SR-85		M13-140		Volume, Channel B
R2A	500K	1/2	9B605	B-60	AD47-500K-S	Q13-133		Treble, Channel A
B	500K	1/2		SR-60	Not Req.	M13-133	▲ UE1402	Treble, Channel B
C	Shaft			Not Req.	KSS-3	Not Req.		
R3A	3meg	1/2	9B604	B-85		Q13-140	■ UE3971	Bass, Channel A
B	3meg	1/2		SR-85		MB-140		Bass, Channel B
R4A	200K	1/2	9B603	B-46	A47-200K-S	Q11-129	U43	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

■ "STA-LOC" equivalent: FA36A, RU36A, CS3500.
▲ "STA-LOC" equivalent: FB55A, RU55A, CS3500.

RESISTORS

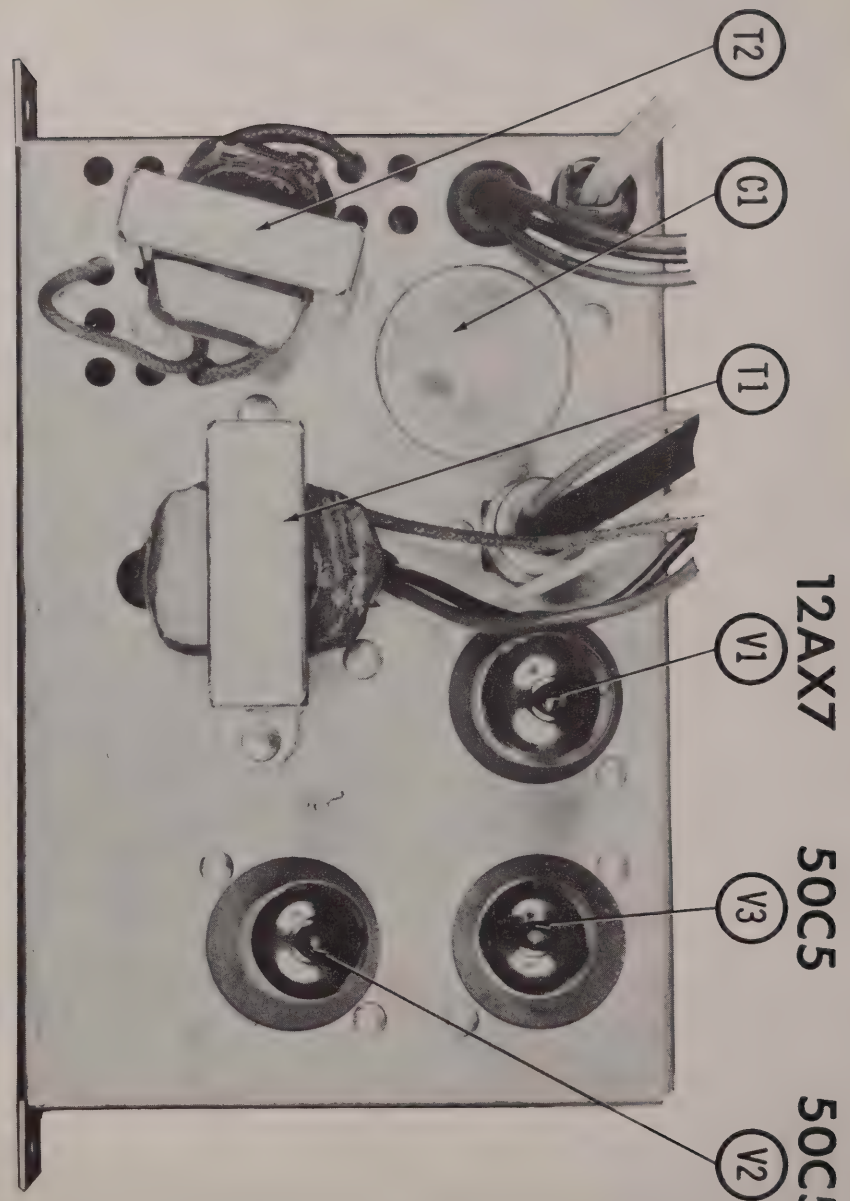
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	100K	
R6	100K	
R7	10meg	
R8	270K	
R9	470K	

ITEM No.	RATING	REMARKS
R10	100Ω 1W	
R11	10meg	
R12	270K	
R13	470K	
R14	2700Ω	

ITEM No.	RATING	REMARKS
R15	100Ω 2W	
R16	47Ω 2W	
R17	47Ω 2W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	5000Ω CT	6-8Ω CT	3B237							
T2	1800Ω CT	3-4Ω	3B238	24S53		AU-605	A-3332	24S53		

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA COLUMBIA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	1B108	6A21	
SP2	6"	PM	3-4Ω	1B108	6A21	
SP3	2½"	PM	3-4Ω	1B118	25AQ7	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.044A	10B614 ①	5E4 ①	HF-154 ①	M150 ①	SR200 ①	① Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2		13TB	Not Req.	ǂ 66	Not Req.	SC-1X	Not Req.	8TA4-S	N-8TA-S

ǂ Use mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA COLUMBIA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3			S-69X † S-69XSD †♦ S-69XDD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M4	Switch	19B626	Monaural-Stereo (DPDT, Slide Type)

CABINETS & CABINET PARTS

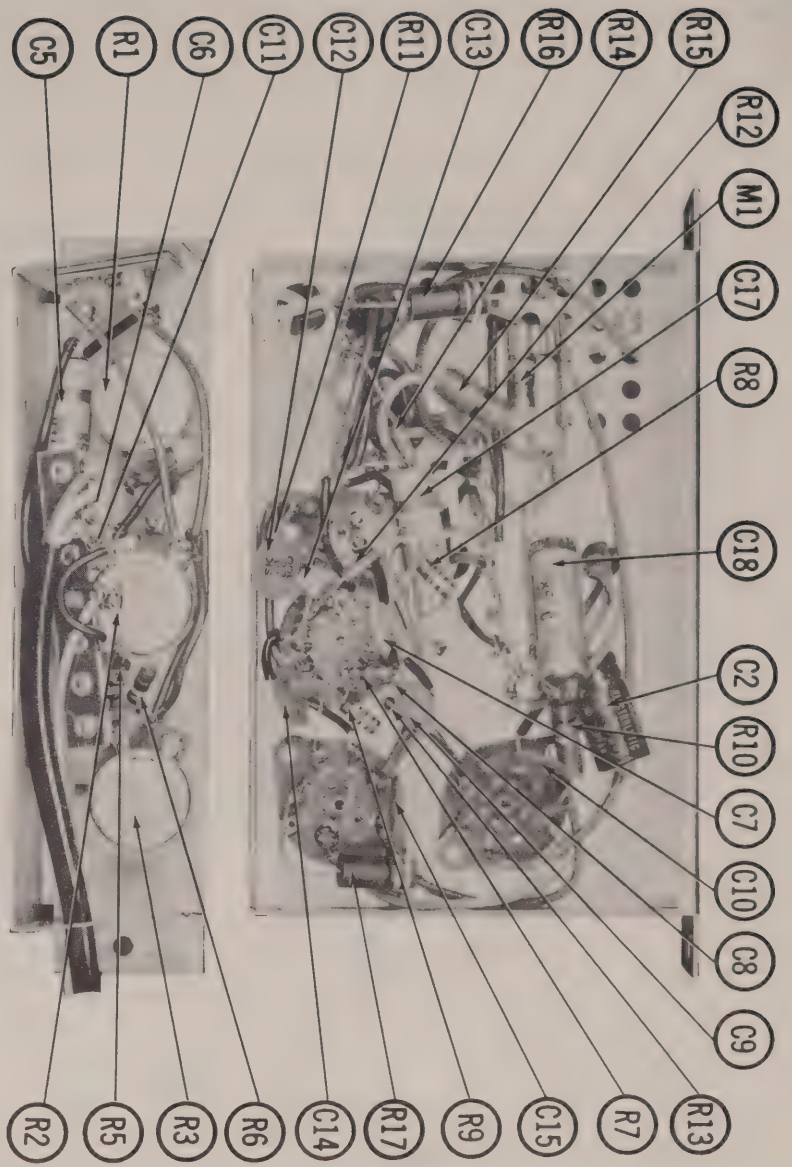
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

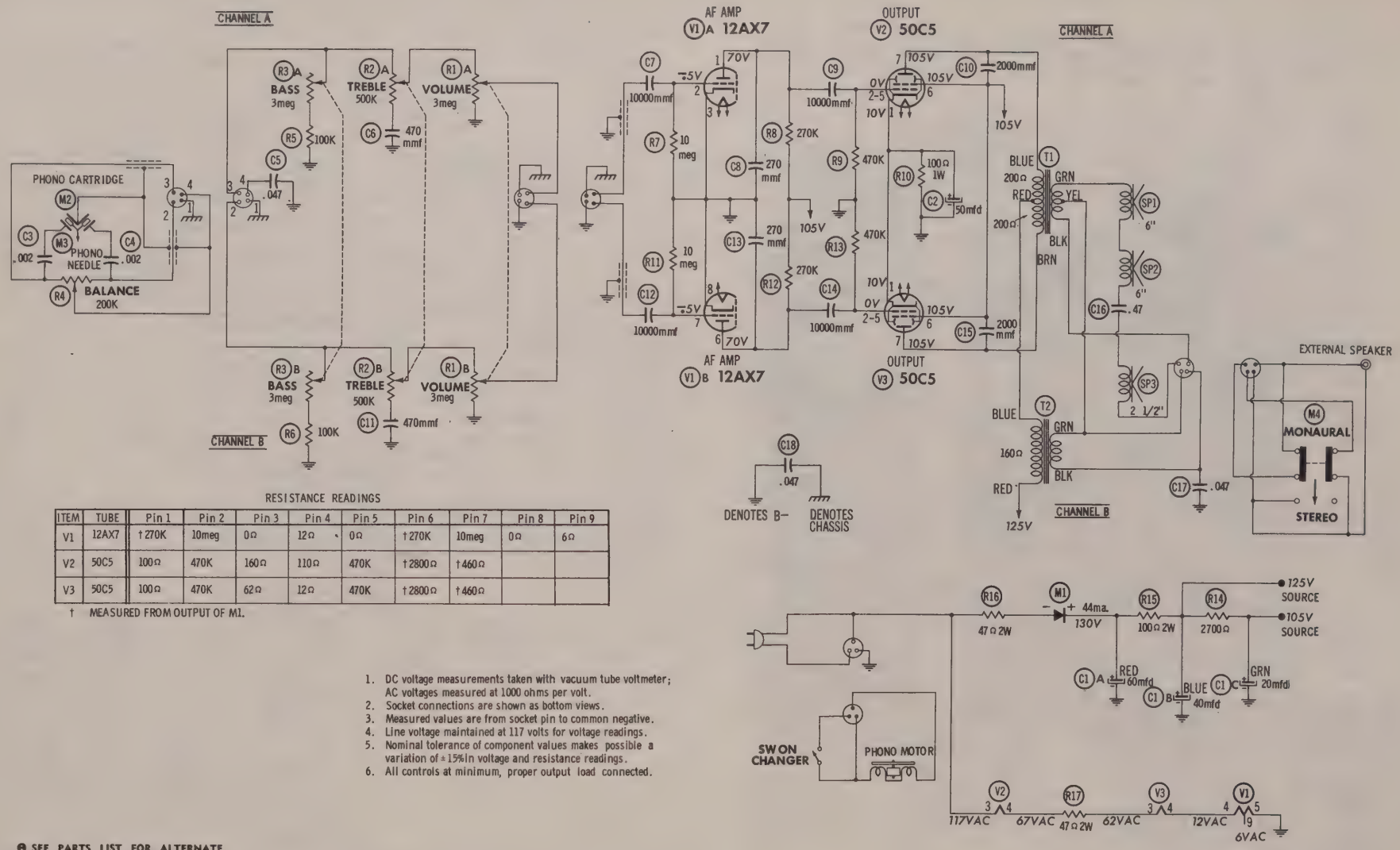
NAME	PART NO.	DESCRIPTION
Knob	8B496	Volume, Treble, & Bass
Knob	8B497	Balance
Cabinet	17B812	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	10meg	0Ω	12Ω	0Ω	†270K	10meg	0Ω	6Ω
V2	50C5	100Ω	470K	160Ω	110Ω	470K	†2800Ω	†460Ω		
V3	50C5	100Ω	470K	62Ω	12Ω	470K	†2800Ω	†460Ω		

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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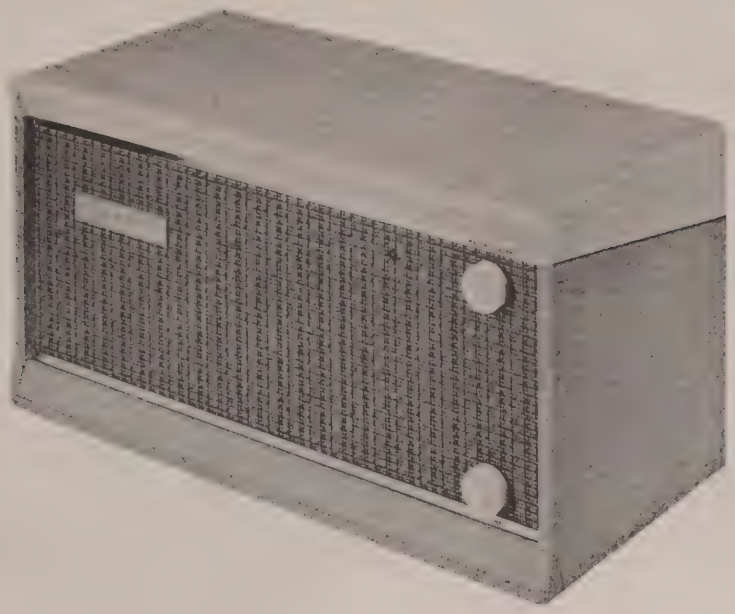
COLUMBIA
MODEL 623

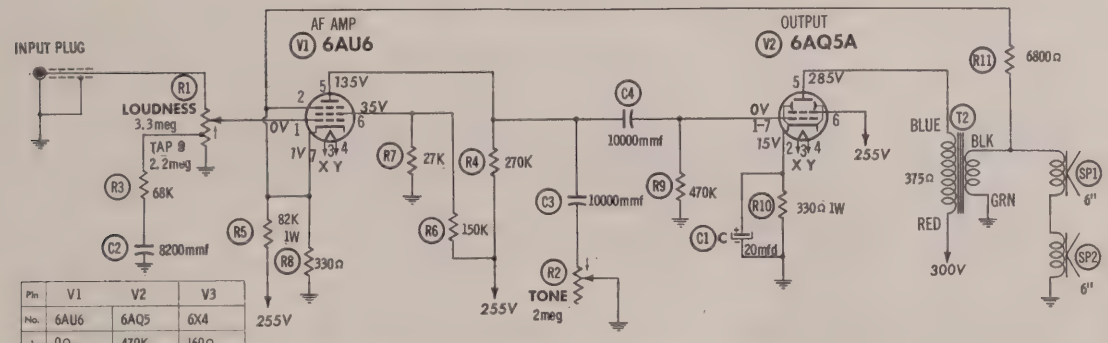
PHOTOFACT® Folder

GENERAL ELECTRIC MODEL AS4A

GENERAL ELECTRIC
MODEL AS4A



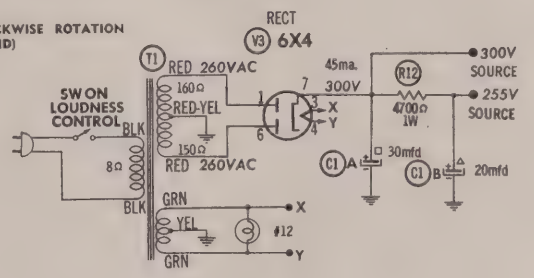
TRADE NAME	General Electric Model AS4A
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 869 Broad St., Utica, N. Y.
TYPE SET	AC Operated 3 Tube Audio Amplifier
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 31 Watts, .36 Amp. @ 117 Volts AC



Pin No.	V1	V2	V3
1	0Ω	470K	160Ω
2	330Ω	330Ω	NC
3	.1Ω	.1Ω	.1Ω
4	.1Ω	.1Ω	.1Ω
5	†270K	†375Ω	NC
6	†80K	†4700Ω	150Ω
7	330Ω	470K	20K(MIN)

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
(CONTROL VIEWED FROM SHAFT END)



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SET 474 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	6AU6	V3	Rectifier	6X4
V2	Output	6AQ5A			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■30	350	RS-2125	AFH3-109	C0830	FP330	TMT-94	TVL-3636	
B	▲20	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	8200		BPD-008	DD-822	CUB16D8	CCD-822	B-282	5BF-D82
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3.3meg	½	RS-2126					Loudness, Tap ⓐ 2.2meg
B	Switch							Push-Pull, Off-On
R2A	2meg	½	RS-2127	B-76	A47-2meg-Z	Q13-139	U55	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	68K	
R4	270K	
R5	82K 1W	
R6	150K	

ITEM No.	RATING	REMARKS
R7	27K	
R8	330Ω	
R9	470K	
R10	330Ω 1W	

ITEM No.	RATING	REMARKS
R11	6800Ω	
R12	4700Ω 1W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .36A	520VCT ⓐ .045A	6.3VCT ⓐ 1.5A	RS-2124	24R09	P-3048		PM8403	24R09	R-8B

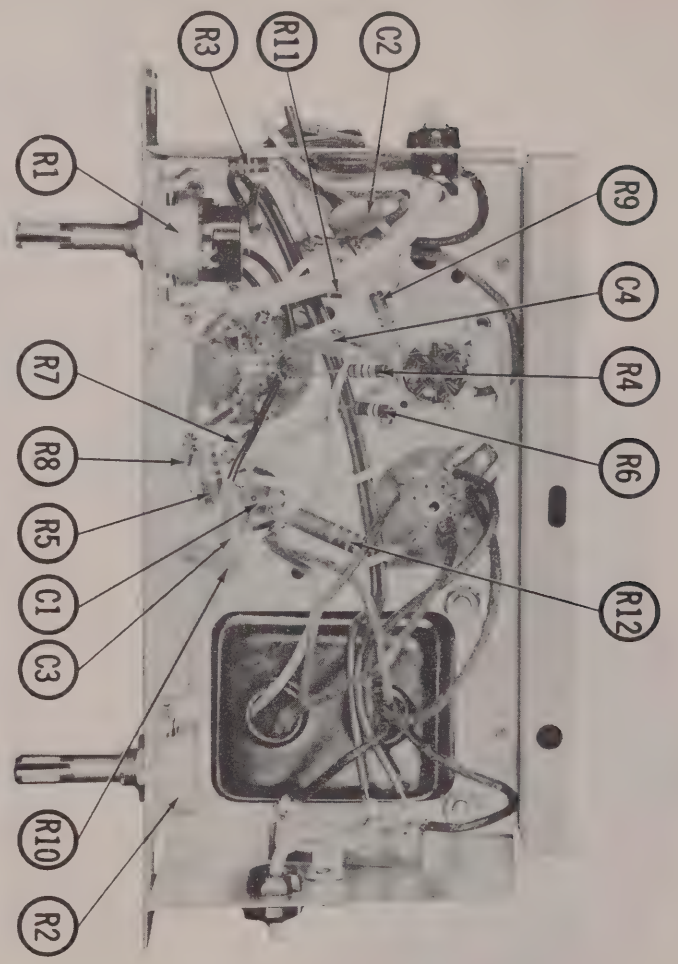
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω	3-4Ω	RS-1793	26S48	A-3020	AU-604	A-8092	26S48	S-5Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	RB-1054	QA15	
SP2	6"	PM	3-4Ω	RB-1054	QA15	

CHASSIS—BOTTOM VIEW



CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RS-2129	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOHAWK
MODELS 300, 400

MOHAWK
MODELS 300, 400

MOHAWK
MODELS 300, 400

GENERAL INFORMATION

The Mohawk Midgetape Models 300 and 400 are battery operated, all transistor, portable tape recorders. The units operate at 1 7/8 ips tape speed and are designed for voice recordings. Recording is dual track on tape supplied in a special cartridge.

The Midgetape features push-button microphone for remote control stop and start and will playback through the microphone, optional earphones or internal speaker. Recordings can be monitored if desired.

The recording time using both tracks is 1 or 1 1/2 hours depending on the type tape used.

Manufactured by:

Mohawk Business Machines Corp.
944 Halsey Street
Brooklyn 33, New York

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JQ489

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TABLE OF CONTENTS

	Page
Specifications	2
Operating Instructions	3
Functions of Controls, Switches, and Indicators	4
Disassembly Instructions	7
Trouble Chart	8
Exploded View of Chassis	9
Troubleshooting Aids	13
Exploded View of Rewind Mechanism	14
Adjustments	14
Cleaning	16
Lubrication	16
Mechanical Parts List	17
Schematic Diagram	19
Electrical Parts List	20

SPECIFICATIONS
(Excluding 402 Power Amplifier)

Dimensions:
Length, 8-1/2" ; width, 3-7/8" ; height, 1-7/8" .

Weight:
Less than 3 lbs.

Frequency Response:
150 to 5,000 cps

Wow and Flutter:
Less than 0.7%

Tape Speed:
1-7/8 ips

Record-Playback Time:
Up to 1-1/2 hours

Input:
2,000Ω — 1 millivolt minimum

Output:
10 milliwatts @ 2,000Ω

Signal-to-Noise Ratio:
42 db

Over-all Gain:
78 db

Bias and Erase Oscillator Frequency:
20kc ± 2KC

B Supply Voltage:
11-7 volts DC

Motor Operating Voltage:
11-7 volts DC

Transistor Complement:
Four-2N217 (or one-GT81, one-GT82, and two -2N406)

Controls:
Three: On-Off, Play-Record, Volume

Battery Life Indicator:
Incandescent lamp

Recording Level Indicator:
Colored marks on Volume control

NOTE: Midgetape can use any microphone of 2,000Ω or less, except a carbon microphone.

402 Power Amplifier

Output:
300 milliwatts

Transistor Complement:
Two-2N217; matched pair.

Controls:
One: On-Off

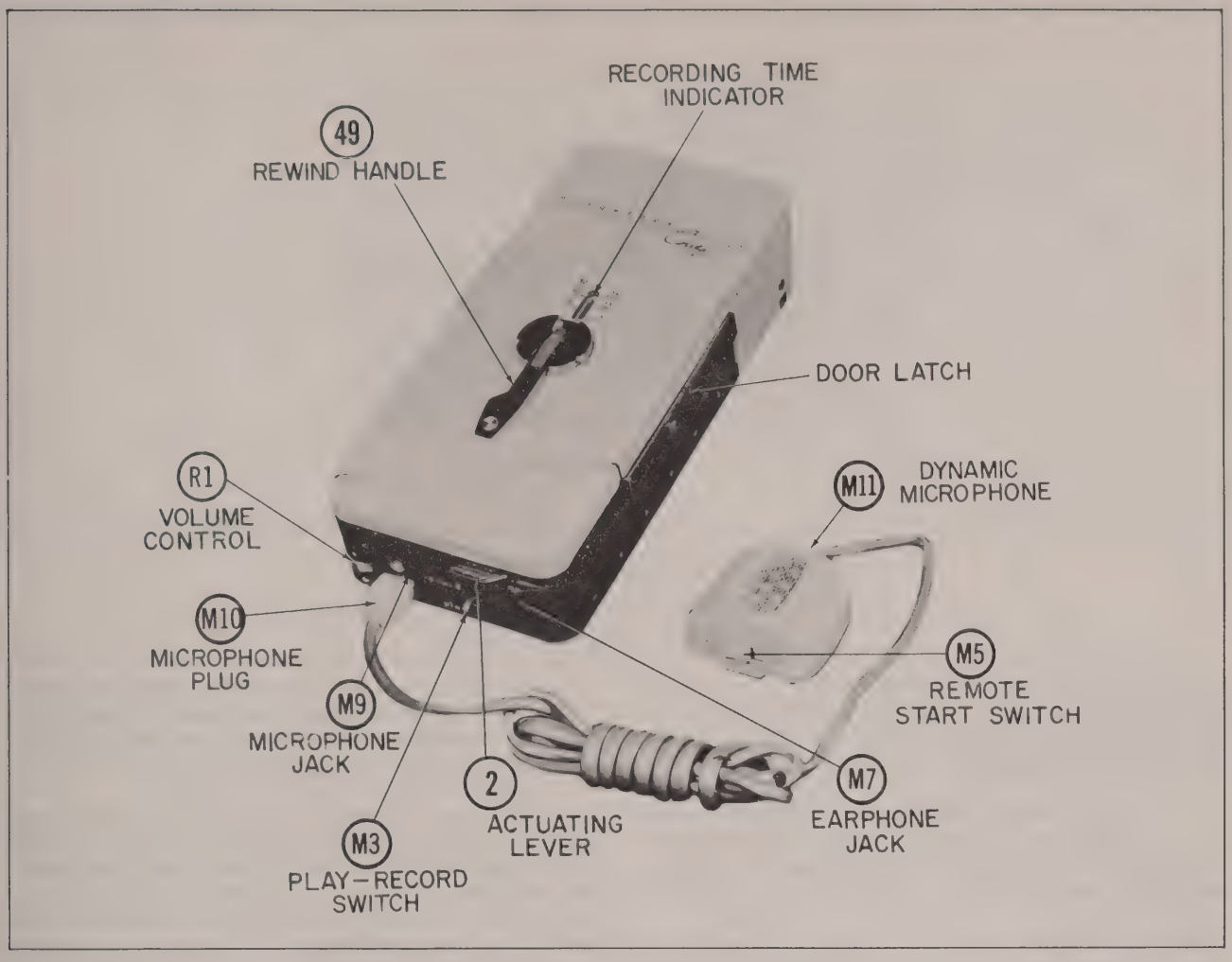


Figure 1.

OPERATING INSTRUCTIONS

To Record

1. Insert microphone plug (M10) into microphone jack (M9).

NOTE: The microphone plug has the letter "D" imprinted on one side; the other side is blank. When the plug is inserted into the microphone jack with the "D" side up, the recording volume is fixed (cannot be varied with the Volume control) for dictation. Good recordings can be made with the microphone anywhere from one inch to two feet away from the speaker's mouth. When the microphone plug is inserted with the blank side up, the Volume control will vary the level of signal to be recorded.

2. Adjust Volume control (if microphone plug is inserted with blank side up). Best recordings are made when the blue mark on the control knob is under the white dot on the case. For distant pickup, advance the control toward the red mark on the control knob. Practice will determine correct recording volume.

3. Place Play-Record switch (M3) in Record position.

4. Start Midgetape by moving recorder actuating lever (2) to the On position. NOTE: On Midgetape Model 400, remote start switch (M5) on microphone (M11) also must be in the On position before the machine can be started.

5. Hold microphone about four inches from mouth, and speak.

To Rewind

1. Move recorder actuating lever (2) to Off position.

2. Lift rewind handle (49) from hole in top of case; place unit in Rewind position.

3. Hold rewind handle down against case and turn handle clockwise. Never force the handle counterclockwise.

4. Rewind tape to desired place. To rewind tape to the beginning, turn rewind handle until it stops. Do not force handle beyond stopping point because damage will result. IMPORTANT: The Midgetape rewind system is so designed that the rewind handle may be turned as rapidly as desired. During rewind, however,

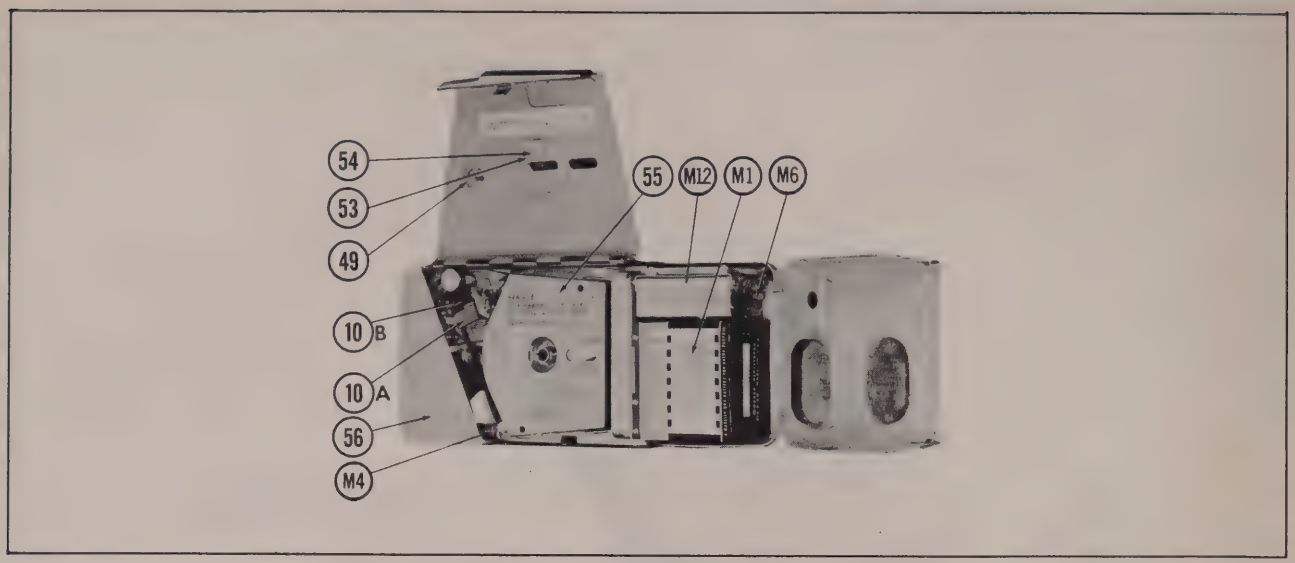


Figure 2. Top View With Covers Open

OPERATING INSTRUCTIONS (Cont.)

slack tape may build up in the cartridge. To compensate for this slack, always make four slow turns at the end of the rewind. This does not apply, of course, when the cartridge is being rewound to the beginning.

5. Always close rewind handle and insert it into its receptacle before recording or playing. This action disengages the red plastic rewind tab and allows the cartridge to turn freely.

To Play

1. Place Play-Record switch (M3) in Play position.

2. Move recorder actuating lever (2) to On position. NOTE: Before the Midgetape Model 400 will play, remote start switch (M5) also must be in the On position if microphone (M11) is plugged in.

3. Adjust Volume control to the desired level (usually somewhere between the red and blue marks). Recordings can now be heard through the microphone or accessory earphones, or through the accessory power amplifier and speaker unit if its On-Off switch (M6) is in the On position.

4. To repeat the playback of any portion of a recording, move the recorder actuating lever (2) to Off, rewind the tape to the desired place, and again follow Steps 1, 2, and 3 under "To Play".

FUNCTIONS OF CONTROLS, SWITCHES, AND INDICATORS

Recorder Actuating Lever (On-Off)

All mechanical operations (except rewind), as well as the application of power to the electrical circuits, are controlled by actuating lever (2). Mechanical action is as follows:

In the Off position, latching cam (17-1) is spring-loaded in the latched position and locks pinch roller bracket (5) in the disengaged position. When actuating lever (2) is moved to the On position, it pushes the tab side of latching cam (17-1) from its spring-loaded position. This action permits pinch roller spring (11) to pivot pinch roller bracket (5) so that pinch roller (4) engages capstan (24-1). When pinch roller bracket (5) pivots, the plastic-covered tab disengages On-Off switch (M4). The switch contacts close and apply power to the motor and amplifier circuits. At the same time, pressure pad assembly spring (23) pivots pressure pad assembly (17-2) so that pressure pads (14) engage heads (10). When actuating lever (2) is moved to the Off position, a cam on pinch roller bracket (5) moves latching cam (17-1) until it locks into position with the cam on bracket (5). Pinch roller spring (11) provides the force which snaps latching cam (17-1) into the engaged position. When pinch roller bracket (5) pivots, the plastic-covered tab engages On-Off switch (M4) and opens the switch contacts. At the same time, pressure pad link (17-3) forces pressure pad assembly (17-2) away from heads (10).

Play-Record Switch

Play-Record switch (M3) is a 5-pole, double-throw switch which selects the appropriate circuits for record and playback. In the Record position, section A connects resistor R20 to ground and completes the base circuit of bias oscillator (X4). At the same time, R16 is placed in series with earphone jack (M7), so that a low-impedance short at the jack will not short the bias and record signals, and connecting and disconnecting the earphones will not change the recording level excessively. Section B applies the battery voltage to the collector and base of bias oscil-

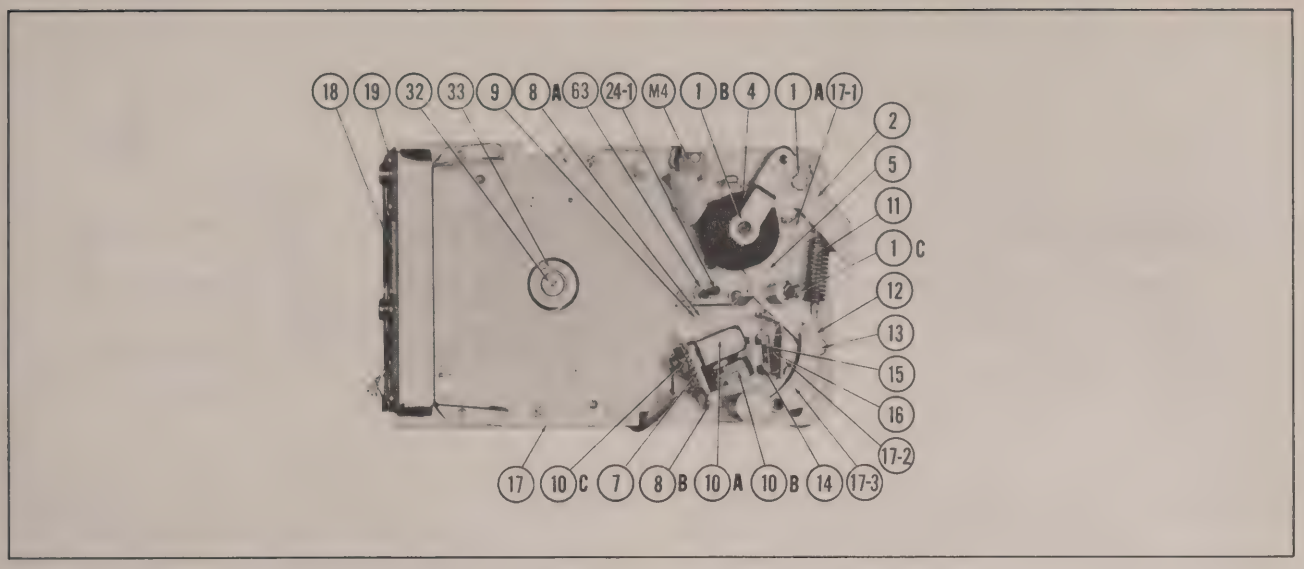


Figure 3. Top View of Chassis Removed From Case

FUNCTIONS OF CONTROLS, SWITCHES, AND INDICATORS (Cont.)

lator (X4) and places it into operation. At the same time, the primary winding of T3 (the driver transformer for the power amplifier) is opened so that the power amplifier cannot function during record. Section C connects the play-record head to the junction of C14 and R15. This action couples both the bias signal and the sound signal to be recorded to the play-record head. Section D connects one of the contacts on microphone jack (M9) to the input of AF amplifier (X2) through capacitor C5. When microphone plug (M10) is inserted with the letter D on the plug facing up, the signal from the microphone is then applied through C5 to the input of (X2) and bypasses preamp (X1) and volume control (R1). This is the "auto-dictate" position; in this position, the signal level to be recorded is fixed. Section E connects another contact on microphone jack (M9) to the input of preamp (X1) through capacitor C1. When microphone plug (M10) is inserted with the blank side facing up, the signal from the microphone is applied through C1 to the input of (X1). In this position, the full amplification of (X1), (X2), and (X3) is available, and the signal level to be recorded can be adjusted with Volume control (R1).

In the Play position, section A bypasses resistor R16 to ground. Thus, the full output signal from (X3) can be placed across the earphones. At the same time, the base circuit of bias oscillator (X4) is opened. Section B completes the primary circuit of T3 (the driver transformer for the power amplifier). This action permits the power amplifier to function when switch (M6) is closed. At the same time, the battery voltage is disconnected from the collector and base of bias oscillator (X4), and it is disabled. Section C connects the play-record head to the input of preamp (X1) through capacitor C1. Sections D and E connect both microphone contacts on microphone jack (M9) to the output of Output/Driver (X3) through capacitor C8. The microphone now functions as a speaker, regardless of which way microphone plug (M10) is inserted.

Volume Control

Rotating Volume control (R1) in the direction of the white arrow on the case increases the signal level during playback. However, the level for record is increased only when microphone plug (M10) is inserted with the blank side facing up. When the blank side faces up, a blue mark on the control knob indicates approximately the best level for recording. (The blue mark should be lined up with the white dot on the case.) The red mark on the control knob indicates the best position for distant pickups.

Power Amplifier On-Off Switch

On-Off switch (M6) is a double-pole, single-throw switch which places power amplifier unit #402 (M12) into or out of the circuit. One side of the switch is in the primary circuit of driver transformer T3; the other side is in the collector and base circuits of output amplifiers (X5) and (X6).

Rewind and Disengage Mechanism

The tape is rewound for playback by hand with the rewind and disengage mechanism. The mechanism consists essentially of a knob, handle, actuator tab, and housing assembly (49); and locking balls (50). The mechanism is the antireverse type and should turn clockwise smoothly and quietly at all times. Mechanical action is as follows:

In the stored position, (Fig. 4A) the rewind knob is locked in place by a spring on the inside of the case door. In the rewind position, (Fig. 4B) the actuator tab disengages takeup pulley (33) from tape cartridge (55) by means of the float pin in the cartridge hub mechanism. At the same time, the tip of the rewind actuator engages the cartridge hub for rewind.

Cartridge-Time Indicator

Each side of the Midgetape cartridge has a window through which the reel of recording tape can be seen. A time scale, calibrated in minutes, is printed along the sides of the window. A similar window and scale are on the case door directly over the cartridge window when the door is closed. The point where the recording tape crosses the time scale indicates the number of minutes of recording time remaining on that side of the cartridge.

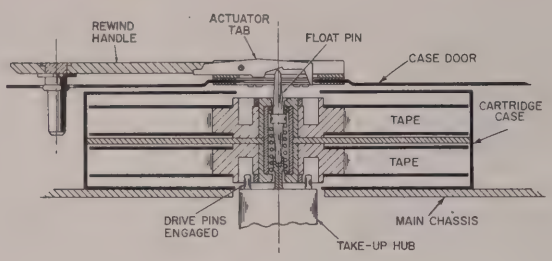


Figure 4A. Cross-sectional View of Tape Cartridge in Machine — Take-up Engaged, Rewind Disengaged.

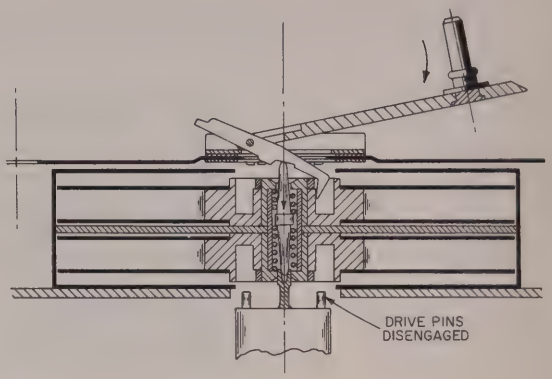


Figure 4B. Cross-sectional View of Tape Cartridge in Machine — Take-up Disengaged, Rewind Engaged.

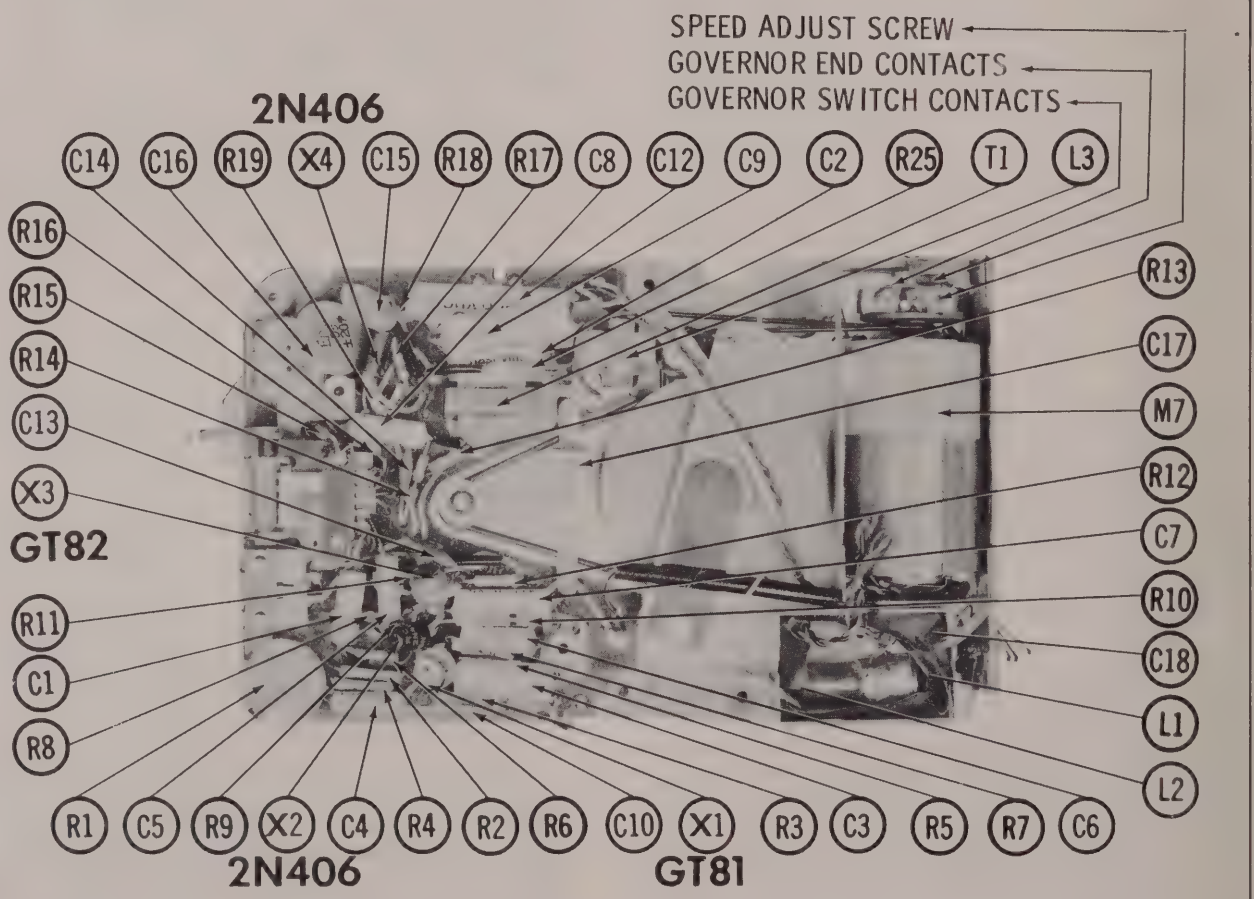


Figure 5. Bottom View of Chassis

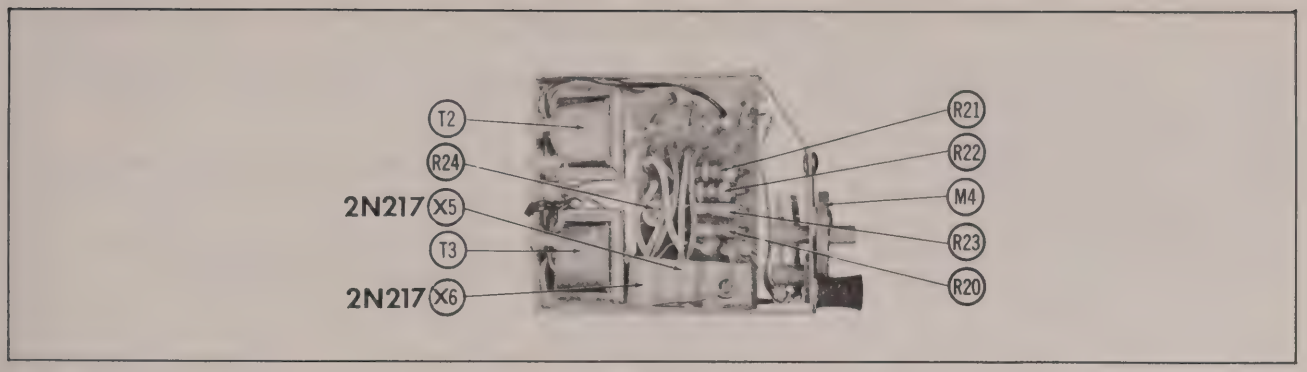


Figure 6. Internal View of #402 Power Amplifier Unit

FUNCTIONS OF CONTROLS, SWITCHES, AND INDICATORS (Cont.)

Battery-Life Indicator

The light on the rear of the Midgetape lights when the main power switch is on. This is the battery life indicator. When this light goes completely out, approximately two hours of battery life remain, and the battery should be replaced. Midgetape batteries, like other batteries, recharge themselves slightly when not in use. This slight recharge may light the battery-life indicator when the Midgetape is first turned on, even though the battery is weak. Therefore, always check the battery-life indicator two or three times during the first few minutes of Midgetape use to be sure the battery is still in good condition.

Microphone On-Off Switch

The push-button On-Off switch on the microphone enables the operator to start or stop the Midgetape remotely for both recording and playback. With the microphone plugged into the microphone jack, set the recorder actuating lever to the On position and depress the push bution to start the Midgetape. To stop the Midgetape, release the push button. For continuous operation, slide the push button from the Off to the On position, and the unit will lock in the On position.

DISASSEMBLY INSTRUCTIONS

1. Place recorder actuating lever (2) in Off position.

2. Set Play-Record switch (M3) halfway between Play and Record positions.

3. Remove all connecting cables (earphone, microphone, etc).

4. Release door latch, and open door.

5. Remove tape cartridge (55).

6. Press spring clips on battery compartment shell outward; open shell.

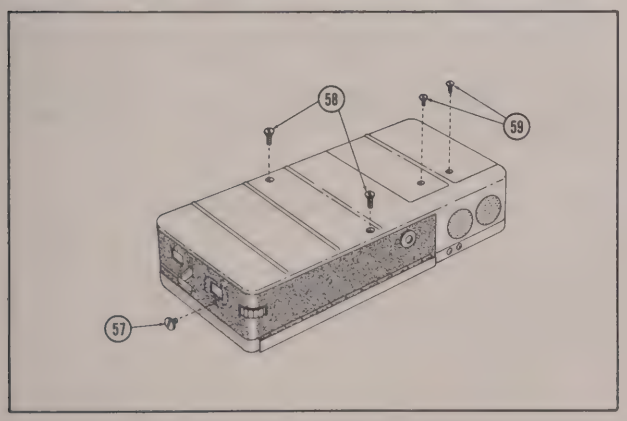


Figure 7. Bottom View of Case

. Remove battery. (Place protective tape over battery contacts to prevent accidental shorting.)

8. Remove screw (57) from front of recorder.

9. Remove two chassis screws (58) from bottom of case.

10. If power amplifier is used, remove two power amplifier screws (59) from bottom of case.

11. Remove power amplifier (if used).

12. Place recorder on edge of bench so that battery compartment shell will swing down and out of way.

13. Grip front end of case with left hand; slide chassis back and out of case with right hand.

CAUTION

1. Do not handle recorder in any way other than as indicated in the foregoing.

2. Never place recorder on switch end.

3. Do not jam running mechanism.

4. Do not force or override the Play-Record switch when chassis is out of the case. (When chassis is in case, the case acts as a lever stop and prevents the lever from being moved past the Play or Record

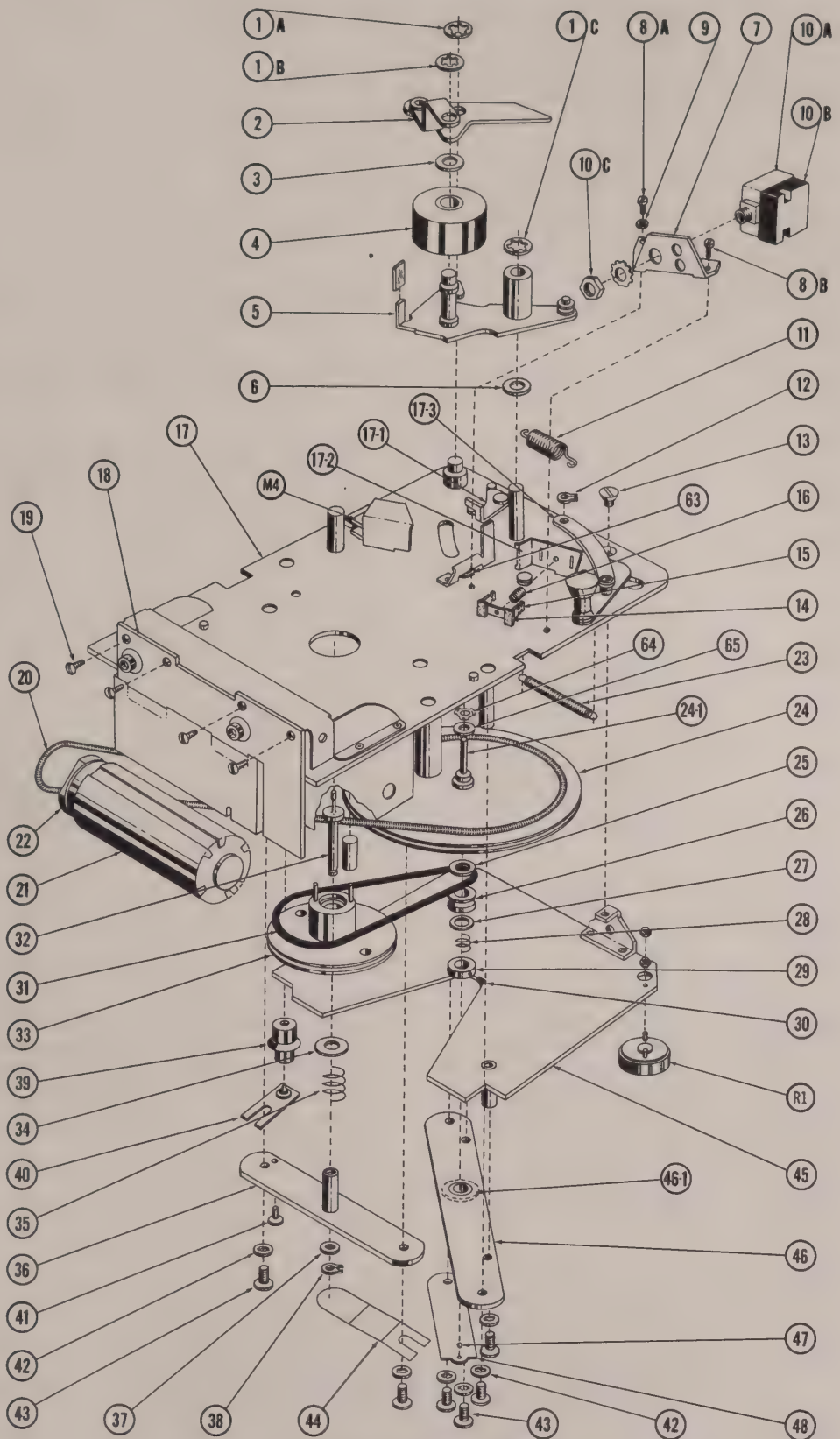
positions.) The switch will position itself, and it is only necessary to move the lever past the center position. Forcing or overriding the switch may dislodge the center contacts from the lever groove in which they normally ride, and the switch may be irreparably damaged. Be particularly careful not to override the switch while reinserting the chassis into the case. Always center the switch lever between the Play and Record positions before reinserting the chassis.

5. Do not disturb any electrical components or wiring.

6. Keep recorder away from all foreign matter. (Perform all work on a clean bench.)

TROUBLE CHART

Symptom	Cause	Remedy
Excessive mechanical noise. (Machine operating without tape cartridge.)	1. If noise is a constant, high-speed grinding, idler pulley (39) may need adjusting or the drive belt may have jumped over the shoulder on the idler pulley. (See Fig. 10.)	1. Adjust idler pulley (39) as described under "Adjustments."
	2. If noise is a slow, pulsing, or thumping sound, there may be interference from the drive belt or flywheel.	2. Hold machine at eye level and check visually for the source of interference.
	3. If noise is apparent only when machine is in case, the wiring is probably too close to the moving parts. These parts rub against the wiring when machine is in the case.	3. Check visually, as described in step 2.
	4. If noise is apparent only when tape cartridge is being used, the cartridge is defective.	4. Replace cartridge or return it to factory for repair.
Tape speed slow; battery-life indicator excessively bright.	1. Governor end contact not making proper connection.	1. Motor assembly may have shifted slightly on sponge rubber shock mounts. Rock motor back and forth on shock mounts, and observe whether end contact maintains connection with governor assembly. If end contact requires adjustment, lift motor slightly and overbend end contact toward the motor to permit more "follow" for the end contact. Clean end contact if required, and apply a small amount of Lubrex grease to its face.
	2. Governor (22) needs adjustment.	2. Adjust governor (22). (See "Adjustments".)
Tape speed fast; battery-life indicator dim or completely out.	1. Governor end contact shorted to chassis.	1. Check visually, and correct.
	2. Governor (22) needs adjustment.	2. Adjust governor (22) (See "Adjustments.")



A PHOTOFACT "EXPLODED" VIEW
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Figure 8. Exploded View of Chassis

TROUBLE CHART (Cont.)

Symptom	Cause	Remedy
Tape speed erratic.	1. Governor switch contacts dirty.	1. Clean governor switch contacts with a fine polishing cloth, such as crocus cloth. Apply a thin film of "hush oil" or pure watchmaker's oil to governor switch contacts, and adjust contacts. (See "Adjustments".)
Battery-life indicator glows, but capstan does not rotate.	1. Main drive belt (20) has slipped off flywheel (24).	1. Reinstall main drive belt (20). (See Fig. 10.) CAUTION: Do not "kink" belt — mechanical noise will result.
	2. Main drive belt (20) broken.	2. Repair or replace main drive belt (20).
Severe electrical noise during playback.	1. Battery-life indicator lamp (M2) open.	1. Replace battery-life indicator lamp (M2).
	2. Motor not in proper position; may be contacting chassis or motor box.	2. Check visually, and correct. (Motor is encased in a copper electrostatic shield, and the entire assembly floats on rubber shock mounts. Severe electrical noise will result if the copper shield is grounded to the motor box.)
Wow or flutter.	1. Tape slippage at capstan (24-1), caused by oily or dirty pinch roller (4) or capstan 24-1).	1. Clean pinch roller (4) and capstan (24-1) thoroughly with alcohol.
	2. Tape slippage at capstan (24-1), caused by actuating lever (2) binding in case slot.	2. Loosen retaining ring (1) slightly so that actuating lever (2) has more play, or remove Midgetape from case and file slot to allow better clearance. CAUTION: Remove any filings from the interior of the case before replacing the Midgetape.
Rewind handle falls out of stored position.	1. Spring on inside of case bent.	1. Bend spring into position with pliers.
Rewind mechanism does not turn smoothly in clockwise direction (without tape cartridge).	1. Rewind housing binds on bearing plate because of insufficient lubrication, warped case door, or excessive dirt in bearing plate.	1. Disassemble rewind mechanism (see Fig. 11). Be careful not to lose the locking balls. Lightly lubricate the bearing surface with any light grease. (CAUTION: Do not allow any grease to get on the locking balls. Grease will cause them to slip when the handle is turned counterclockwise and, thus defeat the antireverse mechanism.) Reassemble rewind mechanism.
Rewind mechanism slips (does not lock) when turned counterclockwise.	1. Grease on locking balls.	1. Clean locking balls with alcohol. (See step 1 of the previous Remedy.)
Rewind mechanism does not rewind tape. (Tape not at end of reel.)	1. Float pin in cartridge hub mechanism sticks and does not disengage take-up pulley.	1. Apply small drop of #10 oil to cartridge hub mechanism. (CAUTION: Do not allow any oil to get on tape or other parts of cartridge.) If the foregoing does not free the float pin, replace the cartridge or return it to the factory for repair.
	2. Tape cartridge bent, jammed, or otherwise defective.	2. Replace cartridge or return it to the factory for repair.
	3. Disengage and rewind actuator worn.	3. Replace disengage and rewind actuator. (See Fig. 11.)

Symptom	Cause	Remedy
Distorted or weak playback. (Battery O.K. Bias properly adjusted.)	1. Tape dust on play-record head (10A).	1. Clean play-record head (10A) thoroughly with alcohol.
	2. Heads (10) not properly aligned.	2. Align heads (10) as described under "Adjustments."
	3. Pressure pads (14) not contacting tape and heads properly or not applying sufficient pressure.	3. Check visually to see that complete contact between pads (14) and heads (10) is being made. For proper pressure pad adjustment, see "Head Alignment" under "Adjustments."
	4. Defective head (10).	4. Replace head (10).
	5. Defective transistor or associated component.	5. Isolate defective component by means of voltage and resistance checks. Replace defective component.
New recording weak or distorted. Older or prerecorded tapes play back normally.	1. Bias not properly adjusted.	1. Adjust bias voltage as described under "Adjustments."
	2. Defective bias oscillator transistor (X4) or associated component.	2. Isolate defective component by means of voltage and resistance checks. Replace defective component.
Insufficient erase or no erase. (Playback of new recordings made over older recordings is garbled or distorted.)	1. Defective erase head.	1. Replace erase head.
Cross talk during playback.	1. Heads (10) not properly aligned.	1. Align heads (10) as described under "Adjustments."
Amplifier dead or weak.	1. Incorrect amplifier current drain.	1. Remove chassis from case, and check amplifier current drain. (See "Troubleshooting Aids", page 13). Drain should be between 5 and 6 ma. Check voltage and resistance readings against schematic. NOTE: If current reading is low, pay particular attention to the points on the board where the eyelet is soldered to the printed circuit pattern (both sides of board). Resolder any doubtful connections. CAUTION: Be extremely careful when soldering connections to transistor leads. Excessive or prolonged application of heat will damage the transistor.
Amplifier dead or weak; current drain checks OK.	1. Open coupling capacitor C1, C4, or C8; open bypass C3; open volume control R1.	1. Isolate defective component by cnecking amplifier gain. (See specifications on page 13.)
Short battery life.	1. Excessive current drain.	1. Check current drain. (See specifications on page 13.) Excessive drain may be caused by the flywheel or idler pulley being misaligned. To align the flywheel, loosen the two capstan bearing plate mounting screws (43) and shift bearing plate (46) until minimum current drain is achieved (battery and ammeter connected; machine operating). Tighten screws while observing ammeter.

TROUBLE CHART (Cont.)

Symptom	Cause	Remedy
Tape fails to spool onto cartridge, or spools too slowly.	1. Defective tape cartridge.	1. Determine whether cartridge is to blame by removing it and observing whether take-up pulley hub (33) is revolving smoothly. If so, the cartridge is defective and should be replaced or returned to the factory for repair.
	2. Excessive slippage of take-up belt (31) on clutch bushing (26), caused by oil or dirt on belt or bushing, or on take-up pulley.	2. If this is the trouble, the check in step 1 of the previous Remedy will show intermittent rotation of take-up pulley hub (33). Clean take-up belt (31), clutch bushing (26), and take-up pulley (33) thoroughly with alcohol.
	3. Insufficient take-up torque on take-up pulley hub.	3. Adjust take-up torque as described under "Adjustments."
Recorder does not turn off when actuating lever is placed in Off position.	1. Main On-Off switch (M4) contacts bent.	1. Remove battery immediately. Adjust switch (M4) contacts.
Remote Start switch (M5) on microphone does not turn off recorder.	1. Remote Start switch (M5) contacts bent.	1. Move actuating lever to Off position. Disassemble microphone and adjust switch (M5) contacts.
Recorder does not start when actuating lever is moved to On position. (Microphone disconnected.)	1. Dead battery.	1. Replace battery.
	2. Battery contacts not making good connection.	2. Check visually and correct.
	3. Main On-Off switch (M4) contacts bent.	3. Remove battery. Adjust switch (M4) contacts.
	4. Center contacts on microphone jack (M9) not making connection when microphone plug is disconnected.	4. Remove battery. Adjust center contacts on microphone jack (M9).
Remote Start switch (M5) on microphone does not start recorder. (Battery O.K. Actuating lever in On position.)	1. Remote Start switch (M5) contacts bent.	1. Move actuating lever to Off position. Disassemble microphone and adjust switch (M5) contacts.
Battery difficult to mount.	1. Female contacts on battery sprung inwardly.	1. Bend battery contacts open. (CAUTION: Do not short the contacts.)
Battery does not hold contacts.	1. Female contacts on battery are sprung outwardly.	1. Bend battery contacts inwardly. (CAUTION: Do not short the contacts.)

Battery Current Drain Specifications (Excluding 402 Power Amp.)

	Total Current Drain (Motor and Amp.)	Amp. Current Drain (Motor Disconnected)
Play	60-70 ma	5-6 ma
Record	77-87 ma	20-22 ma (head connected)

NOTE: The life of the T-12 battery is approximately eight to twelve hours, depending upon which position (Play or Record) is used more often. The eight-to-twelve hour specification is based on the Midgetape being operated without the 402 amplifier. The 402 amplifier is a Class-B operated device; therefore, the current it consumes is directly proportional to the playback level (35 ma average). The louder the playback level, the more current consumed, and vice versa. Since neither the frequency of playback through the 402 amplifier nor the playback level can be predicted, specifications for the T-12 battery apply only when the 402 amplifier is excluded.

To Check Battery Current Drain

1. Remove chassis from case. (See "Disassembly Instructions" on page 7.)
2. Unsolder Main On-Off switch (M4) leads from printed circuit board.
3. Connect ammeter across points on printed circuit board where switch (M4) leads were removed (observe polarity). Midgetape can now be operated out of its case by snapping the battery to the contacts on terminal board (M8). Since the ammeter is in circuit in place of the Main On-Off switch, the machine will start as soon as the battery is connected, unless the microphone is plugged in. If the microphone is plugged in, start and stop the machine with the microphone Remote Start switch.
4. To remove motor from circuit in order to check the current drain of the amplifier only, unsolder the twisted orange and purple leads near choke L1.

To Service Printed Circuit Amplifier

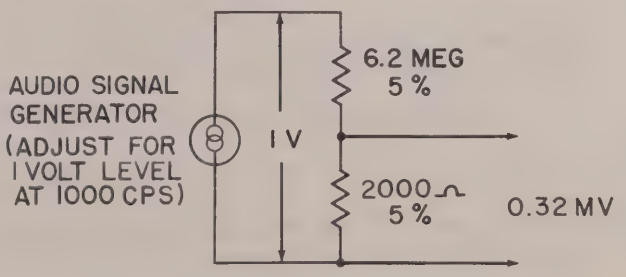
1. Remove chassis from case.
2. Unsolder head leads.
3. Unsolder Main On-Off switch (M4) leads.
4. Unsolder motor leads (twisted orange and purple leads near choke L1).
5. Remove screw (13).
6. Remove four screws (43) which mount the printed circuit chassis to capstan bearing plate (46) and the bearing plate to main chassis (17). Remove capstan bearing plate assembly (46). CAUTION: Be careful not to lose capstan ball bearing (47).
7. Remove printed circuit chassis from main chassis and place in a convenient position for servicing. Do not allow the foil strips to contact the main chassis. Be careful not to break the wires still connected between the main and printed circuit chassis.
8. Connect ammeter across points on printed circuit board where switch (M4) leads were removed.
9. Place Play-Record switch in Play position (switch lever toward component side of printed circuit board).
10. Connect battery to contacts on terminal board (M8). The amplifier will now operate and will be ready for servicing. (If microphone is plugged in, turn amplifier on and off with the Remote Start switch.)

To Check Gain of Amplifier

1. Play-Record switch must be in Play position.
2. Connect audio signal generator between point on printed circuit board where red lead from playback head was connected, and ground.
3. Set generator frequency to 1,000 cycles per second.
4. Connect 2,000-ohm resistor across generator output terminals.
5. Connect 2,000-ohm resistor across earphone jack (M7).
6. Set output level of generator to 0.32 millivolt.
7. AC signal voltage measurements should be as follows:

   Collector of X3 to ground — 1 volt
   Collector of X2 to ground — 10 millivolts
   Collector of X1 to ground — 2.9 millivolts

8. If the output level of the audio generator cannot be set to 0.32 millivolt, the following electrical arrangement will permit the foregoing test to be conducted with a generator output of 1 volt:



ADJUSTMENTS

Head Alignment

Only two adjustments are necessary to properly align play-record and erase heads (10) in the Model 400. The 1/4" — 28 head mounting. nut (10C) is used for azimuth alignment; the #0-80 x 3/16" screw (8A) is used for correct pressure pad pressure adjustment. To assure that cartridges recorded on one Midgetape will sound just as good when played on another Midgetape, the heads should be adjusted to meet factory specifications for prerecorded tapes. For proper adjustment, the following equipment is necessary.

1. Prerecorded 400-3,000 cycle Midgetape alignment cartridge.

2. AC vacuum-tube voltmeter.

3. Telex cable with 2,200-ohm resistor (MTP-3).

Insert the prerecorded alignment cartridge into the Midgetape with the 3,000-cycle side of the tape in position to play. Set controls for Play and for maximum volume. Insert the MTP-3 cable into earphone jack (M7). Connect the AC VTVM across the 2,200-ohm load resistor in the MTP-3 cable. Turn the Midgetape on.

To adjust the heads for azimuth, loosen the 1/4" — 28 head mounting nut (10C) and rock the heads in a "see-saw" manner until maximum deflection is noted on the meter. Maximum deflection should be obtained when the top and bottom of the heads are as nearly horizontal (parallel) to the chassis as possible. When the best setting has been determined, tighten mounting nut (10C) securely.

To adjust the pressure pads for correct pressure on the heads, loosen the #0 — 80 x 3/16" screw (8A) and move the heads and head bracket assembly toward or away from the pressure pads until maximum output is noted on the meter. Tighten screw (8A) securely.

The minimum factory standards for the output of the Midgetape amplifier are as follows:

1. The 400-cycle prerecorded signal should develop 0.7 volts across the 2,200-ohm resistor.

2. The 3,000-cycle prerecorded signal should develop 0.5 volts across the 2,200-ohm resistor.

Adjustments should be made with the 3,000-cycle side of the alignment tape. The reading at 400 cycles should then be checked. But do not make any adjustments at 400 cycles. If the minimum passable readings listed in the foregoing are not obtained, the following procedure should be performed.

1. Check the battery. Replace if necessary.

2. Clean the heads thoroughly with alcohol.

3. Remove the chassis from the case and check the gain of the amplifier. (See page 13.)

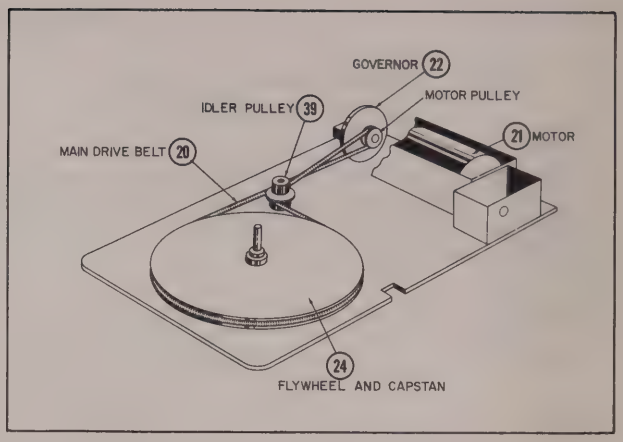


Figure 9.. Bottom View of Chassis Illustrating Main Drive Belt Installation

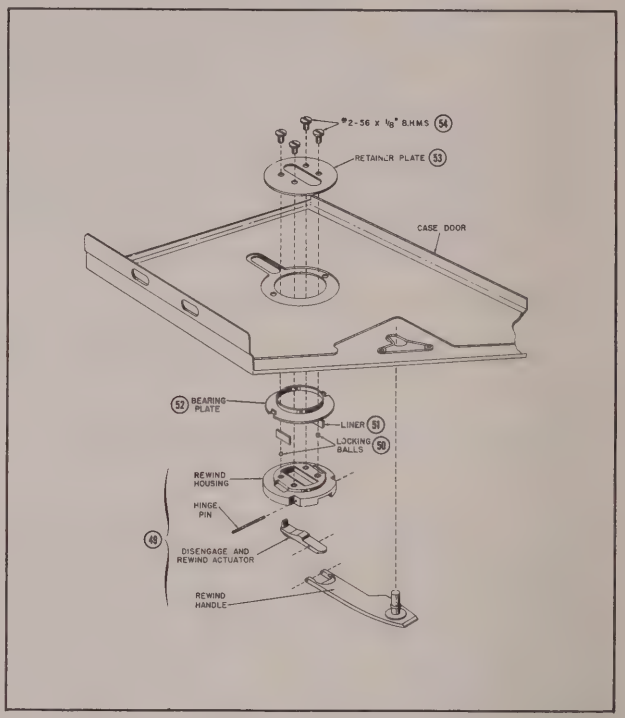


Figure 10. Exploded View of Rewind Mechanism

Bias Oscillator

Proper bias current for recording is 0.6 milliamps at 19 to 22 kc. If the bias is not adjusted properly, recordings will be weak or distorted, or both. Bias current is adjusted with bias oscillator trimmer (C17). Bias should be adjusted whenever recordings become weak or distorted. (But make sure the battery is O.K. and older or prerecorded tapes play back satisfactorily.) Also, adjust the bias whenever bias oscillator transistor (X4) is replaced.

To adjust the bias, proceed as follows:

1. Disconnect the ground lead (black or orange) of the play-record head. Connect a 100-ohm, 1% non-inductive resistor in series with the play-record head.

2. Connect an AC VTVM across the 100-ohm resistor.

3. Set the Midgetape controls for Record and for minimum volume. Leave the microphone disconnected. Do not insert the tape cartridge.

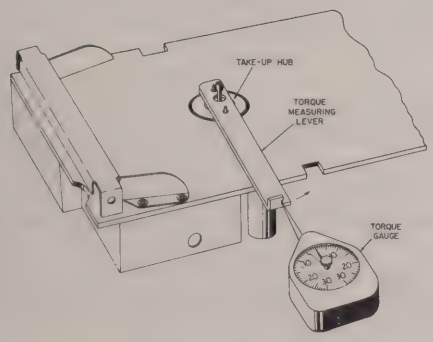
4. Turn the Midgetape on.

5. Adjust trimmer (C17) for a reading of 0.06 volts (60 millivolts) on the meter.

6. Remove the resistor. Reconnect the ground lead of the play-record head.

Take-Up Torque

For the take-up system of the Midgetape to operate properly, 0.8 to 1.4 ounce-inches of take-up torque must be available at the take-up pins on take-up hub (33), This torque is equivalent to 8 to 15 grams measured 2-3/4 inches from the center of the take-up hub with a torque gauge (calibrated in grams) and a special torque measuring lever as illustrated in Fig. 12.



Use the torque gauge and measuring lever in the following manner to determine whether the take-up torque is incorrect and needs adjustment:

A. Place measuring lever on take-up hub, as shown.

B. Hold measuring lever and turn on Midgetape.

C. Place torque gauge arm against notch in end of measuring lever, as shown.

D. To obtain reading, release measuring lever and allow it to move against torque gauge arm until clutch slips and take-up hub stops rotating.

E. When the clutch slips, hold measuring lever again and gently remove gauge from notch in lever. Turn off Midgetape.

F. The reading should be between 8 and 15 grams. If torque needs adjusting, follow instructions above.

Figure 11 Instructions For Use of Torque Gauge And Measuring Lever

Rubber take-up belt (31), which drives the take-up assembly, is coupled to nylon clutch bushing (26). (See Fig. 13.) The inside diameter of the bushing is greater than the outside diameter of the flywheel shaft or capstan (24-1). Therefore, clutch bushing (26) and take-up belt (31) will not turn when the capstan turns unless the bushing is coupled to the capstan by some other means. The bushing is coupled to the capstan by the pressure between clutch bushing (26) and felt clutch washer (25). Felt clutch washer (25) rides on the flywheel hub and acts as a clutch between the flywheel and the bushing. To vary the pressure between clutch bushing (26) and felt clutch washer (25), loosen set screw (30) and move clutch collar (29) up or down until the correct take-up torque is obtained.

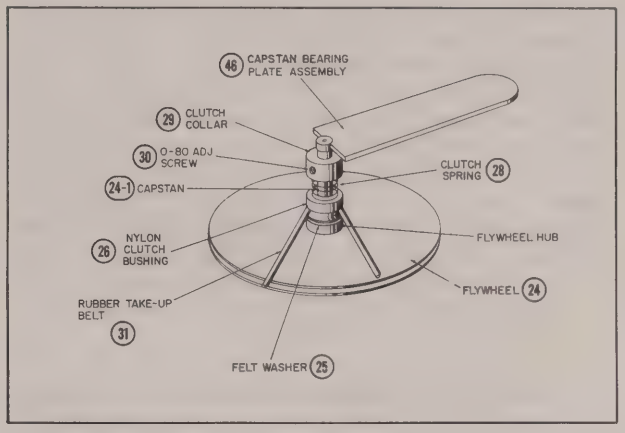


Figure 12. Flywheel And Clutch Assembly

Idler Pulley

Two means of adjusting idler pulley (39) for minimum friction and noise are provided. Idler pulley (39) may be adjusted (with the motor running) by loosening screw (43) holding idler pivot and spring assembly (40). This adjustment is to insure that there is a minimum of friction and noise and that main drive belt (20) is parallel with flywheel (24) as the belt passes over the idler pulley. (NOTE: Idler pulley (39) should be mounted with the small-diameter section facing up, or closest to the chassis.) Screw (41) varies the tension on idler pivot and spring assembly (40). Adjust this tension (while the machine is running) for minimum noise and minimum current drain from the battery. (See "Short Battery Life" in the Trouble Chart, page 11.) Insert an ammeter in series with the battery (see "Troubleshooting Aids", page 13). Adjust screw (41) for minimum noise and current drain, as related to idler pulley adjustment (see current specifications, page 13.)

Motor Governor

Because the Midgetape is battery operated, the drive system must be governor controlled. The governor maintains a constant tape speed of 1-7/8 ips as the life of the battery decreases (within the useful operating limits of the battery voltage, which is approximately 11 to 7 volts). The heart of the drive system is the motor and governor assembly. The motor is a permanent-magnet DC type, which converts electrical energy from the battery into mechanical energy to

operate the tape drive system. The speed of a motor of this type will vary with the battery voltage and the mechanical load. For practical reasons, the battery voltage and the mechanical load must obviously be permitted to vary within certain limits. An electromechanical switch (governor assembly) on the motor shaft compensates for these variations and permits the tape speed to be maintained (within close limits) at 1-7/8 ips.

The governor is a spring-loaded switch mounted at the upper end of the motor shaft. When the motor is not running, the spring holds the switch contacts together and keeps the governor circuit closed. This circuit provides a short-circuit path across the 6-volt battery life indicator lamp. Therefore, the full battery voltage will be applied across the motor. When the motor is running, the centrifugal force developed by the rotating motor shaft opposes the spring force (centripetal force) and tries to open the governor switch contacts. The spring force is constant, but the centrifugal force increases as the motor speed increases. At low speeds, the centrifugal force is smaller than the centripetal spring force, and the contacts remain closed. As the motor speed increases (which it will do if the battery voltage is greater than 7.2 volts), the centrifugal force will eventually equal and overcome the spring force. This point is called the critical speed. At the critical speed, the switch contacts will open and place the 6-volt lamp in series with the motor armature winding. This action will lower the voltage across the motor. The motor will slow down until the governor contacts close, and the cycle will repeat. The governor contacts open and close approximately 60 times per second, and this opening and closing maintains a constant speed control.

The critical speed (the speed at which the two forces acting on the governor are equal) can be adjusted by means of the speed adjusting screw (Fig. 5). Turning the screw clockwise increases the spring force and increases the critical speed. Turning the screw counterclockwise decreases the spring force and reduces the critical speed. To determine whether the Midgetape is running at the correct speed, simply make a mark of some kind on pinch roller (4). Then, with a good battery in the machine and with a tape cartridge inserted, clock the revolutions per second the pinch roller makes when the machine is running. The pinch roller should revolve nine times in fifteen seconds. If the speed is too fast, turn the speed adjusting screw outward (counterclockwise); if the speed is too slow, turn the screw inward (clockwise).

CLEANING

Although the recording tape used in the Midgetape cartridge is of high quality, iron oxide (tape dust) from the tape will be deposited on the recording and erase heads, as well as on the pinch roller, capstan, and tape guide posts. These deposits will eventually cause weak or poor recordings, tape slippage, or excessive noise (tape squeal). The foregoing areas must be cleaned frequently to prevent these troubles. Usually, tape dust deposits can be removed easily with a soft cloth dipped in alcohol. More stubborn cases may require a fine polishing paper, such as crocus cloth, before cleaning with alcohol.

The pinch roller, take-up belt, and other rubber parts must be kept free of oil and grease. The capstan, take-up pulley, clutch bushing, and other parts contacting these rubber parts must also be kept free of oil and grease. Troubles arising from oil and grease are listed in the Trouble Chart and include such symptoms as wow and flutter, and faulty take-up. Remove any oil or grease from the foregoing parts with alcohol and a soft cloth. Always use the alcohol sparingly; never let it fall into electrical parts or around items requiring lubrication.

To assure positive contact at all times, switch contacts must be kept free of dirt and corrosion. To clean switch contacts, fine polishing paper, such as crocus cloth, should be used.

LUBRICATION

All moving parts of the Midgetape were permanently lubricated at the factory. Under normal usage, further lubrication is unnecessary. In heavy-duty service, the following parts should be lubricated about once a year:

1. Capstan bearing plate assembly (46). Apply SAE #10 oil to felt washer (46-1).

2. Capstan ball bearing (47). Apply Lubrex grease.

3. Felt clutch washer (35). Apply SAE #10 oil.

4. Governor end contacts. Apply Lubrex grease.

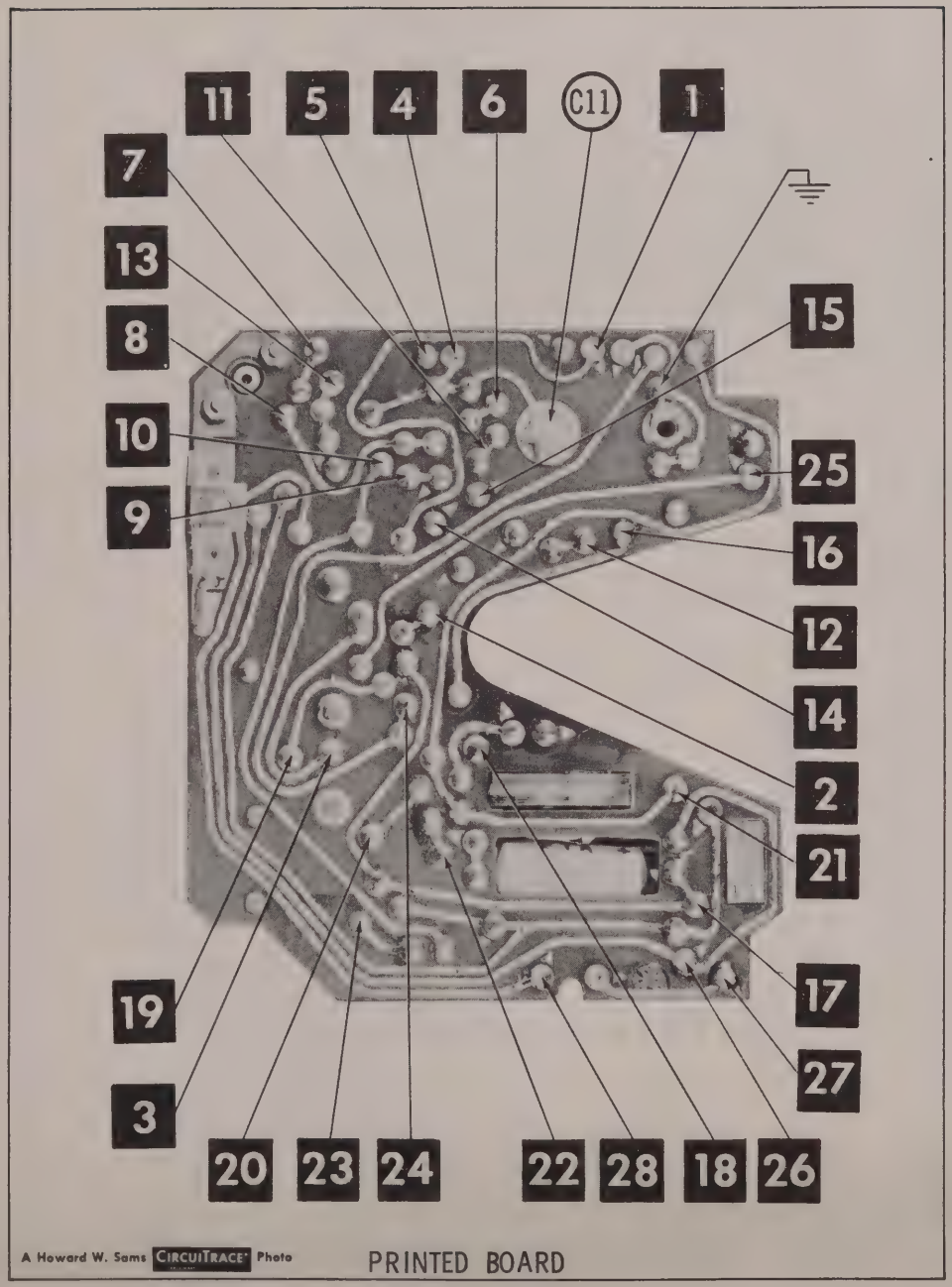
5. Bearing plate (52) of rewind mechanism. Apply Lubrex grease.

6. Tape cartridge hub mechanism. Apply SAE #10 oil.

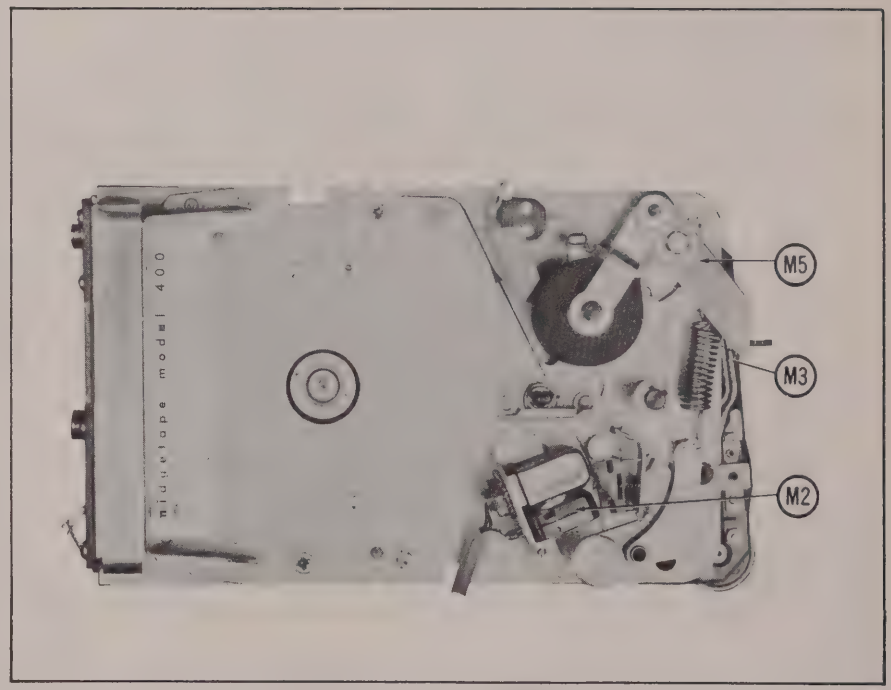
Whenever parts are replaced, all parts requiring oil or grease must be lubricated with the proper lubricant. Do not overlubricate. No part needs more than a slight film of grease, where grease is specified, or one drop of oil, where oil is specified. Oil and grease must be kept off all rubber parts and any parts that might transfer oil or grease to them. Always wipe off any excess lubricant.

Ref. No.	Mohawk Code No.	Description
1	5105-18	Retaining Ring, Truarc
2	16936	Recorder Actuating Lever Assembly
3	16078-1	Shim Washer, Pinch Roller
4	16902	Pinch Roller Assembly
5	16904	Bracket Assembly, Pinch Roller
6	16141	Shim Washer, Pinch Roller Bracket
7	16336	Bracket, Play-Record-Erase Head
8		Screw, Machine, #0-80 x 3/16" Fillister Head
9		Washer, #0 Flat
10	16335	Head, Play-Record-Erase
11	16033	Spring, Pinch Roller
12	5555-12	Retaining Ring, Truarc
13		Screw, Machine, #4-40 x 1/8" Flat-Head
	16610	Pressure Pad Clip Assembly (Complete) Consists of:
14	3035	Pressure Pads
15	16195	Pressure Pad Holder
16	3034	Pressure Pad Spring
17	16925	Main Chassis Staking Assembly (Includes all permanently mounted parts.)
18	16920	Battery Terminal Mount Assembly
19		Screw, Self-Tapping, #2 x 3/16"
20	16048	Main Drive Belt
	16951-2	Motor and Governor Assembly (Complete) Consists of:
21	*	Motor
22	*	Governor Assembly
23	16034	Spring, Pressure Pad Assembly
	16903	Flywheel and Clutch Subassembly (Complete) Consists of:
24	16803	Flywheel and Capstan
25	16235	Felt Washer, Clutch
26	16201	Slip Bushing, Clutch
27	16234	Shim Washer, Clutch
28	16200	Spring, Clutch
29	16202	Collar, Clutch
30		Set Screw, #0-80 x 1/8" Spline
31	16199	Take-up Belt
	16901	Take-up and Disengage Sub-Assembly (Complete) Consists of:
32	16088	Disengage Shaft, Take-up
33	16701	Pulley and Hub, Take-up
34	16136	Shim Washer, Take-up
35	16099	Spring, Take-up
36	16801	Bracket and Anchor Bushing, Take-up
37	16287-5	Spacer
38	5100-12	Retaining Ring, Truarc
39	16013	Idler Pulley
40	16917	Idler Pivot and Spring Assembly
41		Screw, Machine, #2-56 x 1/8" Binding Head
42		Lockwasher, #4 Internal Tooth
43		Screw, Machine, #4-40 x 1/4" Binding Head
44	16175	Spring, Take-up Shaft
45	16930	Electronic Chassis Assembly (Complete) See Electrical Parts List for individual components.
	16934	Electronic Chassis Assembly (Consists of the printed circuit board with the following major components mounted: R1, M3, M7, M9, L1 and T2
46	16948	Bearing Plate Assembly, Capstan
47		1/16" Ball Bearing, Capstan
48	16344	Bearing Spring, Capstan
49	16906	Rewind Handle, Actuator Tab, and Housing Assembly
50		1/16" Locking Balls, Rewind Mechanism
51	16212	Liner, Rewind Mechanism
52	16112	Bearing Plate, Rewind Mechanism
53	16045	Retainer Plate, Rewind Mechanism
54		Screw Machine, #2-56 x 1/8" Binding Head
55	16954	Tape Cartridge Assembly
56	16929	Case Assembly
57		Screw Machine, #4-40 x 1/8" Binding Head
58		Screw Machine, #4-40 x 3/8" Flat Head
59		Screw Machine (for mounting power amplifier)
60		Screw Self-Tapping, #2 x 1/8" Round Head
61	16868	Shield Cover, RF Filter Assembly
62	16867	Shield Cover, Motor Assembly
63		Ball Bearing Assembly, Capstan
64		Pre-loaded Washer, Capstan
65		Shim Washer, Capstan

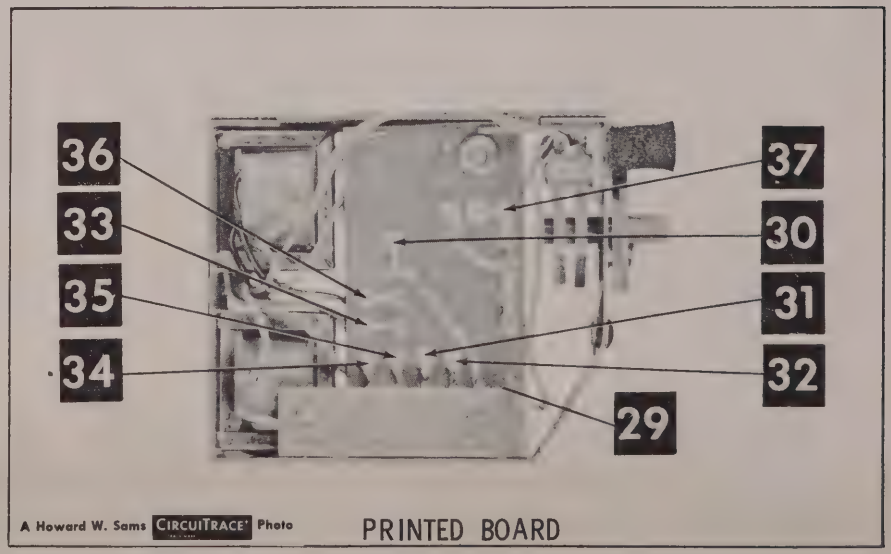
* Not replaceable individually.



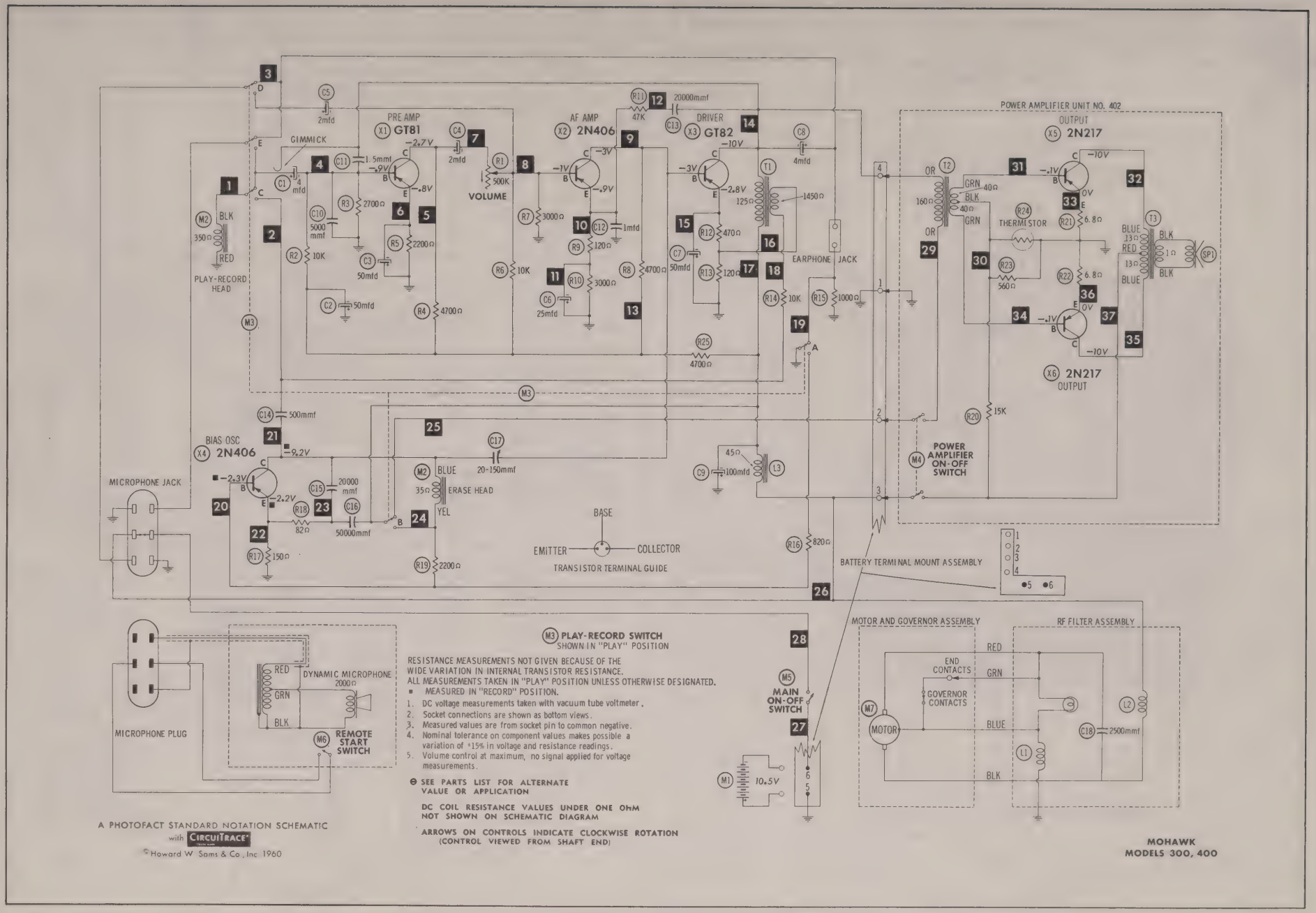
A Howard W. Sams CIRCUITRACE Photo PRINTED BOARD



CHASSIS TOP VIEW



A Howard W. Sams CIRCUITRACE Photo PRINTED BOARD


POWER AMPLIFIER UNIT NO. 402
PRE AMP X1 GT81
AF AMP X2 2N406
DRIVER X3 GT82
OUTPUT X5 2N217
OUTPUT X6 2N217
BIAS OSC X4 2N406
GIMMICK
VOLUME
PLAY-RECORD HEAD
ERASE HEAD
EARPHONE JACK
THERMISTOR
MICROPHONE JACK
MICROPHONE PLUG
DYNAMIC MICROPHONE 2000Ω
REMOTE START SWITCH
POWER AMPLIFIER ON-OFF SWITCH
MAIN ON-OFF SWITCH
BATTERY TERMINAL MOUNT ASSEMBLY
MOTOR AND GOVERNOR ASSEMBLY
RF FILTER ASSEMBLY
END CONTACTS
GOVERNOR CONTACTS
MOTOR
TRANSISTOR TERMINAL GUIDE
BASE
EMITTER
COLLECTOR
M3 PLAY-RECORD SWITCH SHOWN IN "PLAY" POSITION
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
■ MEASURED IN "RECORD" POSITION.
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
© Howard W Sams & Co., Inc 1960
MOHAWK MODELS 300, 400

ELECT. PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA: CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	GT81 *	Preamplifier		2N405	2N362	2N109	PNP
X2	2N406	AF Amplifier		2N406	2N362	2N406	PNP
X3	GT82 ♦	Driver		2N405	2N362	2N109	PNP
X4	2N406	Bias Oscillator		2N406	2N362	2N406	PNP
X5	2N217	Output		2N217	2N633	2N217	PNP) Matched
X6	2N217	Output		2N217	2N633	2N217	PNP) Pair

* Selected for low noise. ♦ Selected for high gain.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: MOHAWK PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	4	11		XPP-12004	EC5-15	TT12X5	ML4-15	TE-1123	
C2	50	6		PWE6050	EC50-6	TT6X50	ML50-6	TE-1100	
C3	50	6		PWE6050	EC50-6	TT6X50	ML50-6	TE-1100	
C4	2	6		PWE6002	EC2-6	TT6X2	ML2-6	TE-1081	
C5	2	6		PWE6002	EC2-6	TT6X2	ML2-6	TE-1081	
C6	25	1		PWE3025	EC25-3	TT3X25	ML25-3	TE-1055	
C7	50	6		PWE6050	EC50-6	TT6X50	ML50-6	TE-1100	
C8	4	11		XPP-12004	EC5-15	TT12X5	ML4-15	TE-1123	
C9	100	11		PWE25100	BBR100-15	TT15X100	ML100-15	TE-1135	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	5000		BPD-005	DM-502	BYA10D5	CCD-502	GP250	5HK-D50
C11	1.5		NPO-DI 1.5	DTZ-1R5	C10V15C	CCTO-1R5	CNO-510	10TCC-V15
C12	1.0 200V		P282Z-1.0		MPX2W1			118P10502S2
C13	20000		C80V203AM	DDM-203	H-05S2		TA-120	5HK-S20
C14	500		BPD-0005	DD-501	BYA10T5	CCD-501	GP350	10TS-T50
C15	20000		C80V203AM	DDM-203	H-05S2		TA-120	5HK-S20
C16	50000		C80V503AM	DDA-503	H-05S5		TA-150	5HK-S50
C17	20-150					424		
C18	2500		SI 2500	D6-252	BYA10D25	CCD-252	GP225	5HK-D25

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOHAWK PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500K	1/4		B16-118				Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	10K	
R3	2700Ω	
R4	4700Ω	
R5	2200Ω	
R6	10K	
R7	3000Ω	
R8	4700Ω	
R9	120Ω	

ITEM No.	RATING	REMARKS
R10	3000Ω	
R11	47K	
R12	470Ω	
R13	120Ω	
R14	10K	
R15	1000Ω	
R16	820Ω	
R17	150Ω	

ITEM No.	RATING	REMARKS
R18	82Ω	
R19	2200Ω	
R20	15K	
R21	6.8Ω	
R22	6.8Ω	
R23	560Ω	
R24		Temp. Comp.
R25	4700Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOHAWK PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke	16958						1.8uh
L2	RF Choke	16958						1.8uh

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: MOHAWK PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L3	.005A	45Ω	1.3 Hy.	16277						

TRANSFORMER (RECORD OUTPUT)

ITEM No.	TURNS RATIO: PRI.	TURNS RATIO: SEC.	REPLACEMENT DATA: MOHAWK PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1	1	16210						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO: PRI.	TURNS RATIO: SEC.	REPLACEMENT DATA: MOHAWK PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	1	1	16308						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: MOHAWK PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	200Ω CT	12Ω	16307							

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: MOHAWK PART No.	QUAM PART No.	NOTES
SP1	2"	PM	12-14Ω	16288		

BATTERIES

ITEM No.	VOLTAGE	MOHAWK PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	10.5V	16292		2X7					

MISCELLANEOUS

ITEM No.	PART NAME	MOHAWK PART No.	NOTES
M2	Head	16335	Play-Record-Erase
M3	Switch		Play-Record Switch
M4	Switch		Power Amp. Off-On
M5	Switch		Off-On (Main)
M6	Switch		Remote STPRT
M7	Motor	16951-2	Includes Governor Assembly
	Microphone Ass'y	16971	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Case	16929	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

EIA MEMBER

OLYMPIC CONTINENTAL MODEL GB375

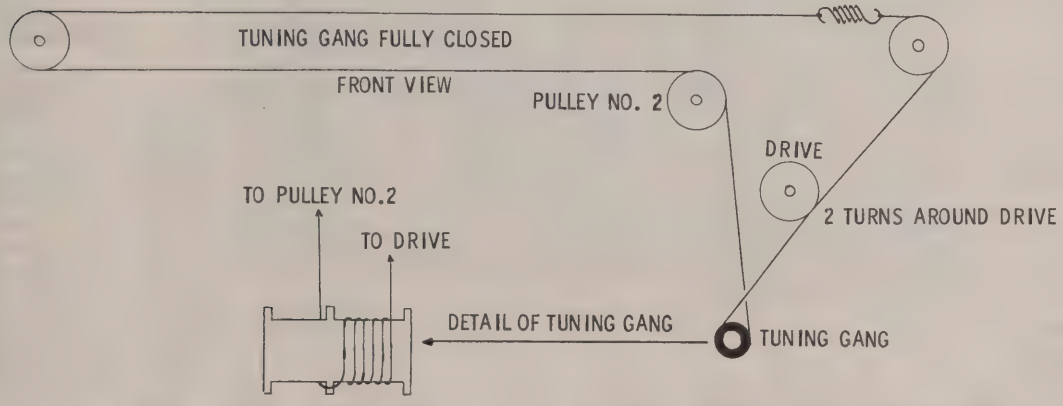
OLYMPIC CONTINENTAL
MODEL GB375

OLYMPIC CONTINENTAL
MODEL GB375

TRADE NAME	Olympic Continental Model GB375		
MANUFACTURER	Olympic Radio & TV Inc., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	AC Operated 9 Tube FM-BC-SW Receiver With 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	64 Watts, .65 Amp. @ 117 Volts AC (FM)
TUNING RANGES	BROADCAST 535 - 1620KC FREQ. MOD. 88 - 108MC	SHORT WAVE	6 - 18MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #RX25907-1 - SEE SIMILAR MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11

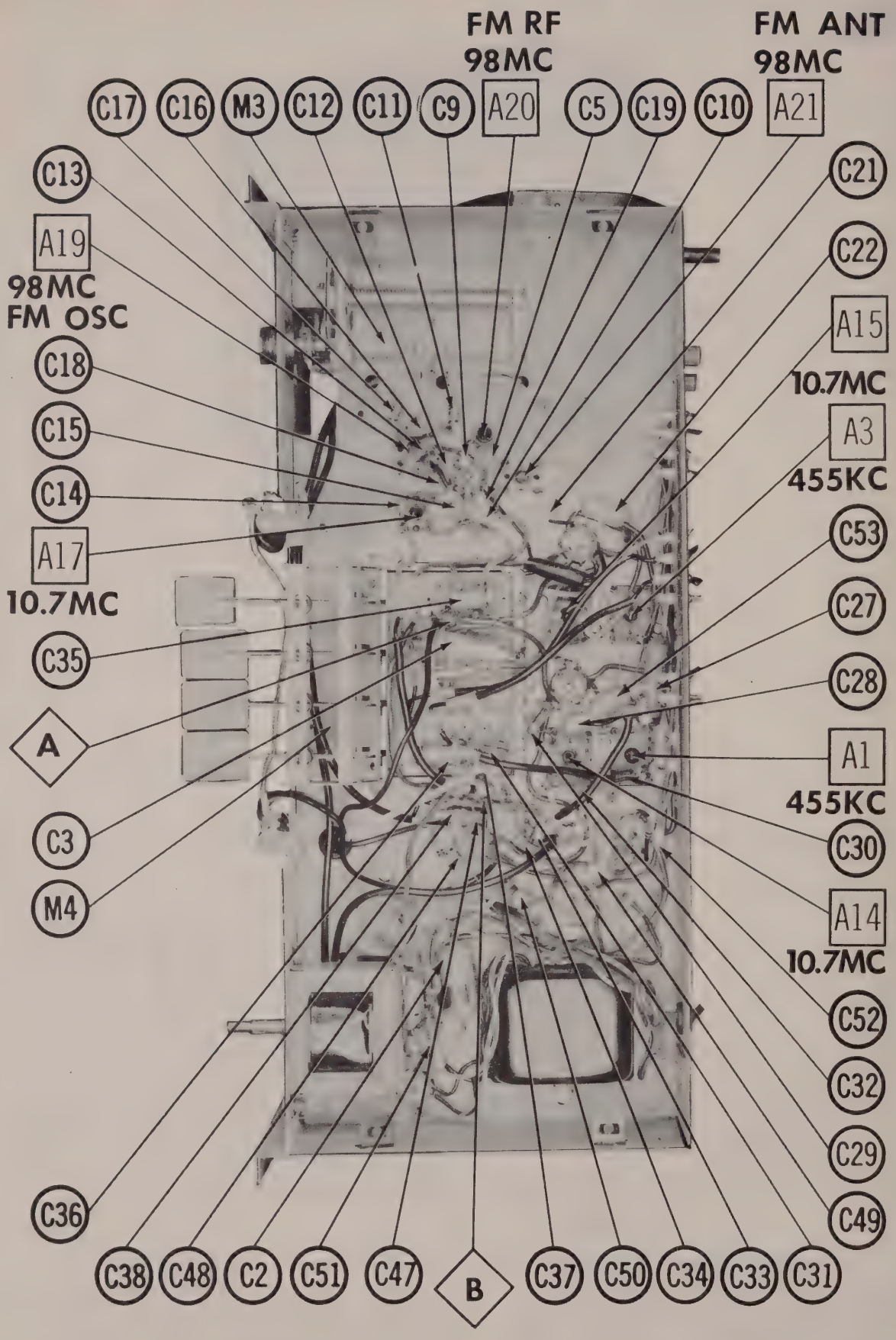
DIAL CORD STRINGING



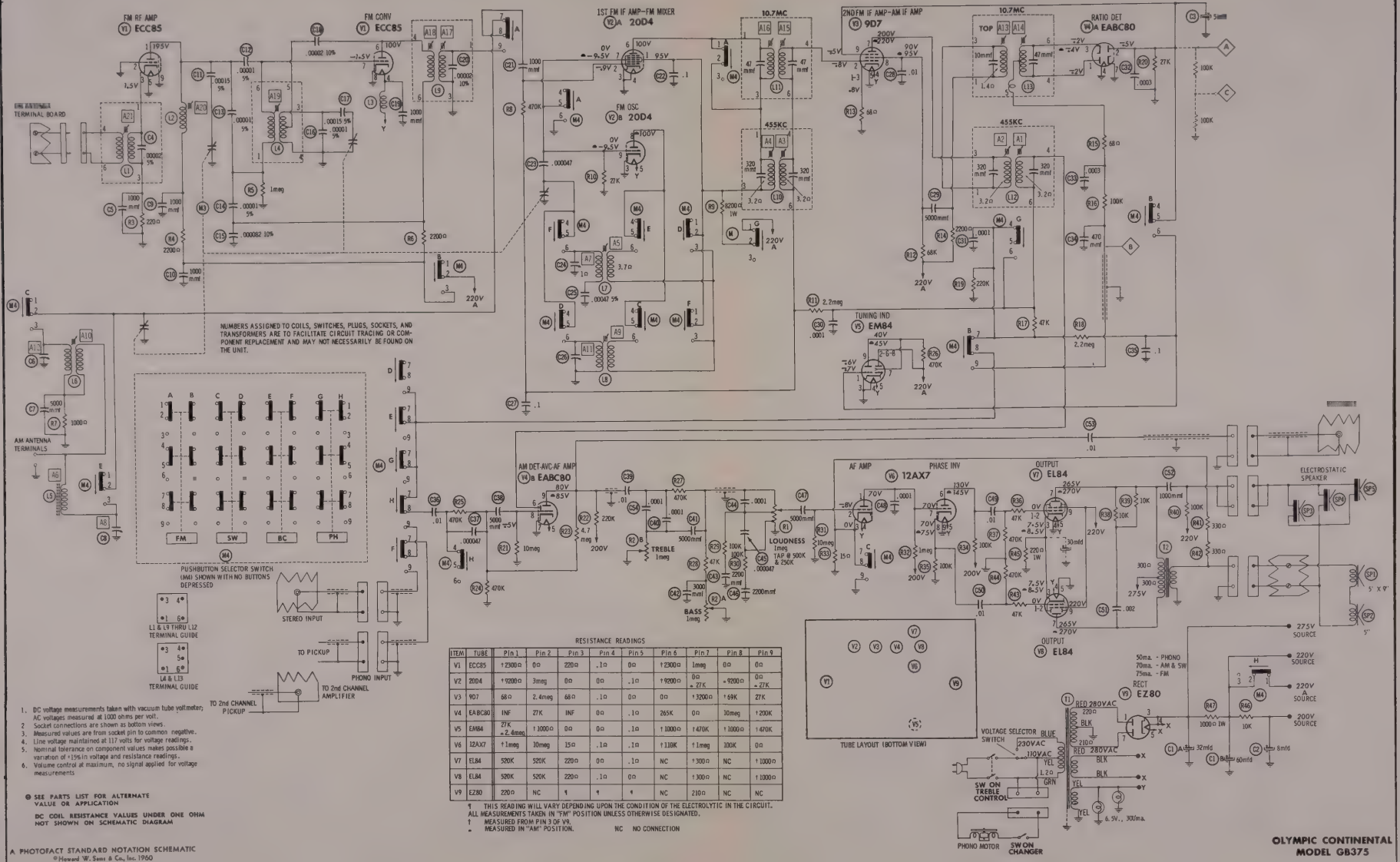
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JM445



CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	↑2300Ω	0Ω	220Ω	.1Ω	0Ω	↑2300Ω	1meg	0Ω	0Ω
V2	20D4	↑9200Ω	3meg	0Ω	0Ω	.1Ω	↑9200Ω	0Ω + 27K	←9200Ω	0Ω + 27K
V3	9D7	68Ω	2.4meg	68Ω	.1Ω	0Ω	0Ω	↑3200Ω	↑69K	27K
V4	EABC80	INF	27K	INF	0Ω	.1Ω	265K	0Ω	10meg	↑200K
V5	EM84	27K ←2.4meg	↑1000Ω	0Ω	0Ω	.1Ω	↑1000Ω	↑470K	↑1000Ω	↑470K
V6	12AX7	↑1meg	10meg	15Ω	.1Ω	.1Ω	↑110K	↑1meg	100K	0Ω
V7	EL84	520K	520K	220Ω	0Ω	.1Ω	NC	↑300Ω	NC	↑1000Ω
V8	EL84	520K	520K	220Ω	.1Ω	0Ω	NC	↑300Ω	NC	↑1000Ω
V9	EZ80	220Ω	NC	¶	¶	¶	NC	210Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
↑ MEASURED FROM PIN 3 OF V9.
← MEASURED IN "AM" POSITION. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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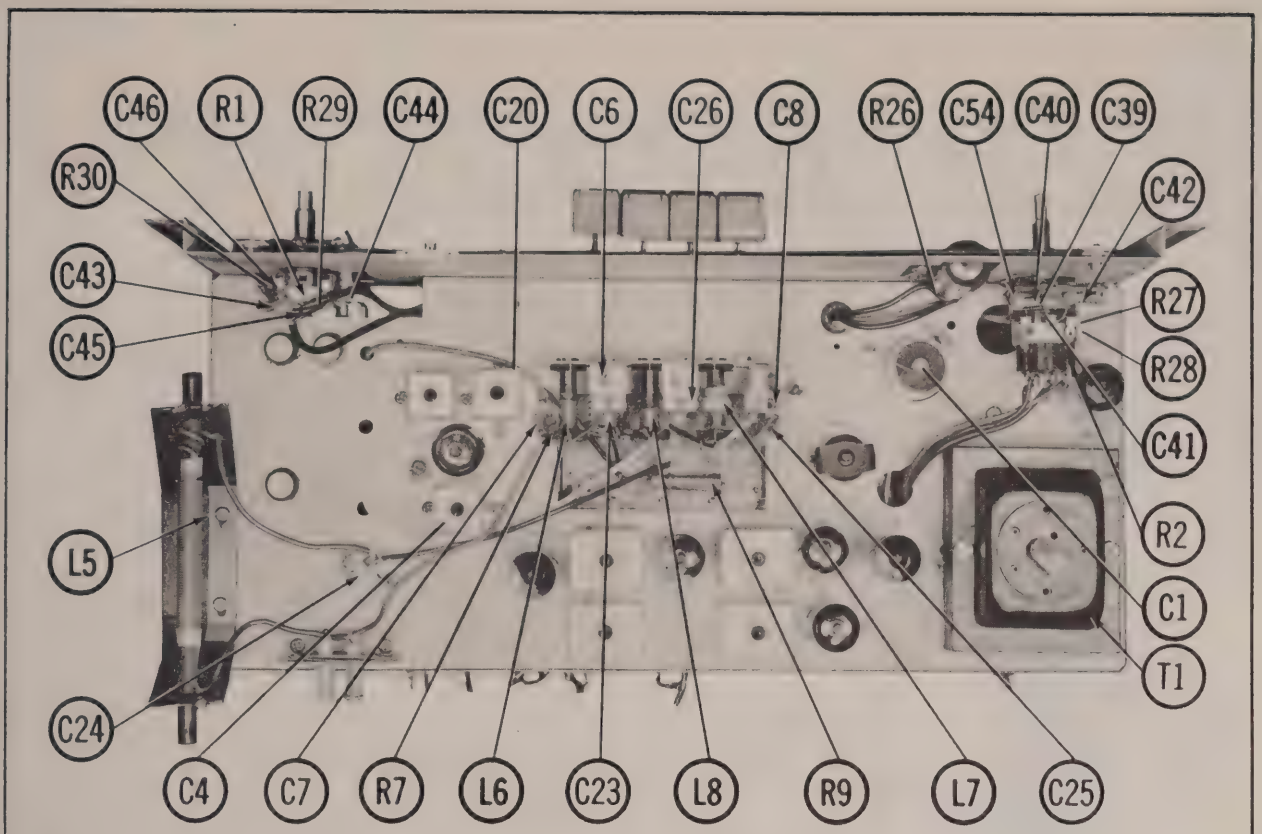
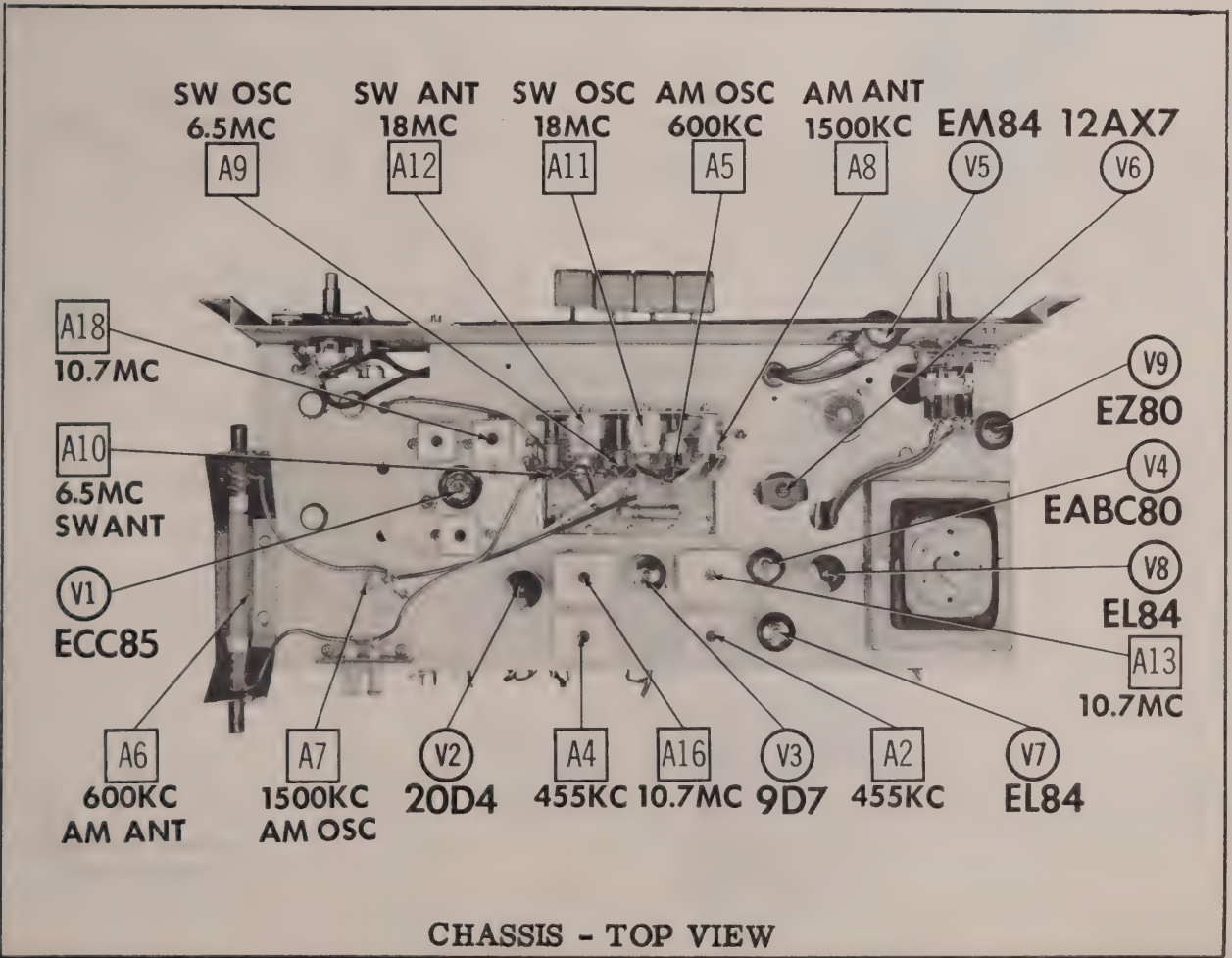
OLYMPIC CONTINENTAL MODEL GB375



CHASSIS - TOP VIEW



CHASSIS - TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A5, A9, A10, A19 thru A21 .... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A7, A8, A11, A12 ..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A13 thru A18 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	BC	600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	600KC	"	"	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	"	1500KC	"	A7, A8	"
4.	400Ω	Across AM antenna socket thru 400Ω resistor	6.5MC	SW	6.5MC	"	A9, A10	"
5.		"	18MC	"	18MC	"	A11, A12	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.001mfd	High side to pin 2 (grid) of 2nd FM IF Amplifier Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe thru 100K to point (A). Common to chassis.	A13	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe thru 100K to point (B). Common to point (C).	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.		Two turn loop around FM RF Amplifier Tube.	"	"	"	DC probe thru 100K to point (A). Common to chassis.	A15, A16, A17, A18	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.001mfd	High side to pin 2 (grid) of 2nd FM IF Amplifier. Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 100K to point (A). Low side to chassis.	A13	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry similar to Fig. 1. Reconnect C3.
7.	"	"	"	"	"	Vert. Amp. thru 100K to point (B). Low side to chassis.	A14	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.
8.	"	"	"	"	"	Vert. Amp. thru 100K to point (A). Low side to chassis.	A15, A16, A17, A18	Disconnect C3. Adjust for maximum gain and symmetry similar to Fig. 1. Reconnect C3.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	300Ω	Across FM antenna terminals with 300Ω in high side.	98MC (30% Mod. FM)	FM	98MC	Across voice coil	A19, A20, A21	Adjust for maximum output.

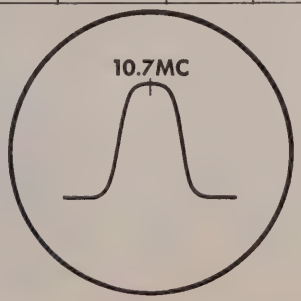


FIG. 1

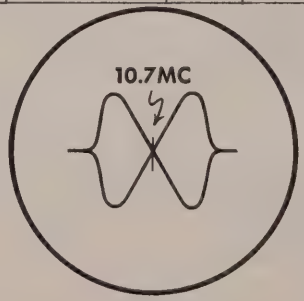


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amplifier - FM Converter	ECC85 (6AQ8) *	V5	Tuning Indicator	EM84
V2	1st FM IF Amplifier - AM Mixer - AM Osc.	20D4 (6AJ8) *	V6	AF Amplifier - Phase Inverter	12AX7
V3	2nd FM IF Amplifier - 1st AM IF Amplifier	9D7 (6BY7) *	V7	Output	EL84 (6BQ5) *
V4	Ratio Detector - AM Det. - AVC - AF Amplifier	EABC80 (6AK8) *	V8	Output	EL84 (6BQ5) *
			V9	Rectifier	EZ80 (6V4) *

* American Equivalent

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	32	300	COE25272	PRS2430	BR6035	TCD2302	TD-60-350	TVAS-2585 *	
B	60	300			BR3035		TD-30-350		
C2	8	300	COE30043	PRS1610	BR835	TC61	TD-8-350	TVA-1603	
C3	5	50	COE25270	SRE50V5	NLW5-50	TT50X5	ML5-50	TE-1303	

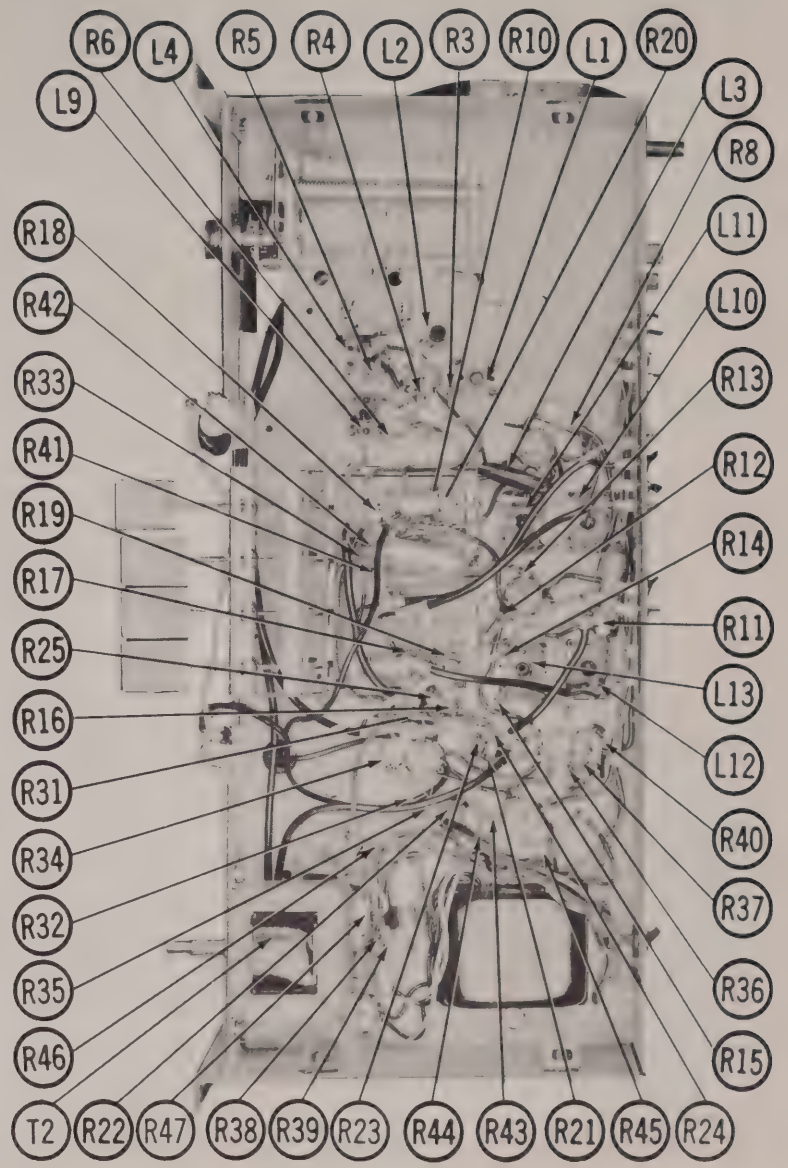
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.00002 350V 5%			TCZ-20	C10Q2C	CM-20B-200J	CNO-422	10TCC-Q20
C5	1000		SI 1000	D6-102	BYA10D1	CCD-102	UC-521	5HK-D10
C6		#CTE25245						
C7	5000		SI 5000	D6-502	BYA10D5	CCD-502	UC-525	5HK-D50
C8		#CTE25245						
C9	1000		SI 1000	D6-102	BYA10D1	CCD-102	UC-521	5HK-D10
C10	1000		SI 1000	D6-102	BYA10D1	CCD-102	UC-521	5HK-D10
C11	.00015 350V 5%			TCZ-150	22R5T15	CM-20B-151J	CNO-315	10TCC-T15
C12	.00001 350V 5%			TCZ-10	C10Q1C	CM-20B-100J	CNO-410	10TCC-Q10
C13	.00001 350V 5%			TCZ-10	C10Q1C	CM-20B-100J	CNO-410	10TCC-Q10
C14	.00001 350V 5%			TCZ-10	C10Q1C	CM-20B-100J	CNO-410	10TCC-Q10
C15	.000082 350V 10%			TCZ-82	C10Q82C	CCTO-820	GP482	10TS-Q82
C16	.00001 350V 5%			TCZ-10	C10Q1C	CM-20B-100J	CNO-410	10TCC-Q10
C17	.00015 350V 5%			TCZ-150	22R5T15	CM-20B-151J	CNO-315	10TCC-T15
C18	.00002 350V 10%			TCZ-20	C10Q2C	CCTO-200	GP420	10TS-Q20
C19	1000		SI 1000	D6-102	BYA10D1	CCD-102	UC-521	5HK-D10
C20	.00002 350V 10%			TCZ-20	C10Q20C	CCTO-200	GP420	10TS-Q20
C21	1000		SI 1000	D6-102	BYA10D1	CCD-102	UC-521	5HK-D10
C22	.01 500V		P688N-01	D6-103	CUB6SI	6DP-2-103	GEM-611	6TM-SI
C23	.000047 350V			D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C24		#CTE25245						
C25	.00047 350V 5%				5R5T47	CM-20B-471J	MCJ244	MS-347
C26		#CTE25245						
C27	.1 350V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C28	.01 500V		P688N-01	D6-103	CUB6SI	6DP-2-103	GEM-611	6TM-SI
C29	5000		SI 5000	D6-502	BYA10D5	CCD-503	UC-525	5HK-D50
C30	.0001 350V		P688N-0001	D6-101	PM6T1	CCD-101	UC-531	10TS-T10
C31	.0001 350V		P688N-0001	D6-101	PM6T1	CCD-101	UC-531	10TS-T10
C32	.0003 350V			D6-301	L10T3	CCD-301	UC-533	10TS-T30
C33	.0003 350V			D6-301	L10T3	CCD-301	UC-533	10TS-T30
C34	470		SI 470	D6-471	BYA10T47	CCD-471	UC-5347	10TS-T47
C35	.1 500V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C36	.01 500V		P688N-01	D6-103	CUB6SI	6DP-2-103	GEM-611	6TM-SI
C37	.000047 350V			D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C38	5000		SI 5000	D6-502	BYA10D5	CCD-502	UC-525	5HK-D50
C39	.01 500V		P688N-01	D6-103	CUB6SI	6DP-2-103	GEM-611	6TM-SI
C40	.0001 350V		P688N-0001	D6-101	PM6T1	CCD-101	UC-531	10TS-T10
C41	5000		SI 5000	D6-502	BYA10D5	CCD-502	UC-525	5HK-D50
C42	3000		SI 3000	D6-302	BYA10D3	CCD-302	UC-523	5HK-D30
C43	2200		SI 2200	D6-222	BYA10D22	CCD-222	UC-5222	5HK-D22
C44	.0001 350V		P688N-0001	D6-101	PM6T1	CCD-101	UC-531	10TS-T10
C45	.000047 350V			D6-470	L10Q47	CCD-470	GP447	10TS-Q47

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C46	2200		SI 2200	D6-222	BYA10D22	CCD-222	UC-5222	5HK-D22
C47	5000		SI 5000	D6-502	BYA10D5	CCD-502	UC-525	5HK-D50
C48	.0001 350V		P688N-0001	D6-101	PM6T1	CCD-101	UC-531	10TS-T10
C49	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C50	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C51	.002 500V		P688N-002	D6-202	CUB6D2	6DP-2-202	GEM-622	6TM-D2
C52	1000		SI 1000	D6-102	BYA10D1	CCD-102	UC-521	5HK-D10
C53	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C54	.0001 350V		P688N-0001	D6-101	PM6T1	CCD-101	UC-531	10TS-T10

Olympic Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	PTE30050	ABT-165 *		Q18-137XX *	UDT-289 *	Loudness
	250K tap, 500K tap							
B	Shaft			AK-9		PQ	Not Req.	
R2A	1meg	½	PTE30049	F1-52				Bass
B	1meg			R2-52		† QJ-1116R	■ UE4046S	Treble
C	Switch			KR-2				Power Off-On

† "Concentrikit" Equivalent: K-6 Kit with base elements and shafts: B13-137, P17-031 (Panel)
(Not available as a factory assembled unit.) B13-137, R9-110 (Rear)
76-2 (Switch)

■ "STA-LOC" Equivalent: FA16A, RU16A, OS1000A, IS-1437, US42.

* File or saw slot 1/4" from shaft end.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	220Ω	
R4	2200Ω	
R5	1meg	
R6	2200Ω	
R7	1000Ω	
R8	470K	
R9	8200Ω 1W	
R10	27K	
R11	2.2meg	
R12	68K	
R13	68Ω	
R14	2200Ω	
R15	68Ω	
R16	100K	
R17	47K	

ITEM No.	RATING	REMARKS
R18	2.2meg	
R19	220K	
R20	27K	
R21	10meg	
R22	220K	
R23	4.7meg	
R24	470K	
R25	470K	
R26	470K	
R27	470K	
R28	47K	
R29	100K	
R30	100K	
R31	10meg	
R32	1meg	

ITEM No.	RATING	REMARKS
R33	15Ω	
R34	100K	
R35	100K	
R36	47K	
R37	470K	
R38	10K	
R39	10K	
R40	100K	
R41	330Ω	
R42	330Ω	
R43	47K	
R44	470K	
R45	220Ω 1W	
R46	10K	
R47	1000Ω 1W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Antenna Trans.	TRE25242						
L2	FM RF Coil	CLE30052						
L3	Fil. Choke	CKE25260	19-1001	19-1001	BC-562	4604		1.4uh
L4	FM Osc. Coil	CLE25253						
L5	Loopstick	LPE25259						
L6	SW Antenna Coil	CLE25252						
L7	BC Osc. Coil	CLE25255						
L8	SW Osc. Coil	CLE25251						
L9	1st FM IF Trans.	TRE25241						
L10	1st AM IF Trans.	TRE25239						
L11	2nd FM IF Trans.	TRE25237						
L12	2nd AM IF Trans.	TRE25240						
L13	Ratio Detector	TRE25238						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	220V Tap @ 117V @ .65A	560VCT @ .075A	6.3V @ .6A	TRE25244						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 3.8A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	10K CT	6-8Ω	TRE25243	24S56 ①	A-2901①	AU-600 ①	A-3831 ①	24S56 ①	S-53X ①	① Use original frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	5" x 9"	PM	3-4Ω	SKE30040	5A07	
SP2	5"	PM	3-4Ω	SKE30037		
SP3	Electrostatic			SKE25268		
SP4	Electrostatic			SKE25268		
SP5	Electrostatic			SKE25268		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	OLYMPIC PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		86TS-TB	N7-7 N8-3	66 †	Not Req.				

† Use PT-3 Mount.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	OLYMPIC PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2		W-106STS † or W-106STD ♦	CRA-55 † or CRA-55X † or CRA-55XD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M3	Tuning Cap.	CVE30046	AM, 2 Gang (Ant. 5-567mmf, Osc. 5-570mmf)
M4	Switch	M56/240	Pushbutton Type (Phono-BC-SW-FM)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

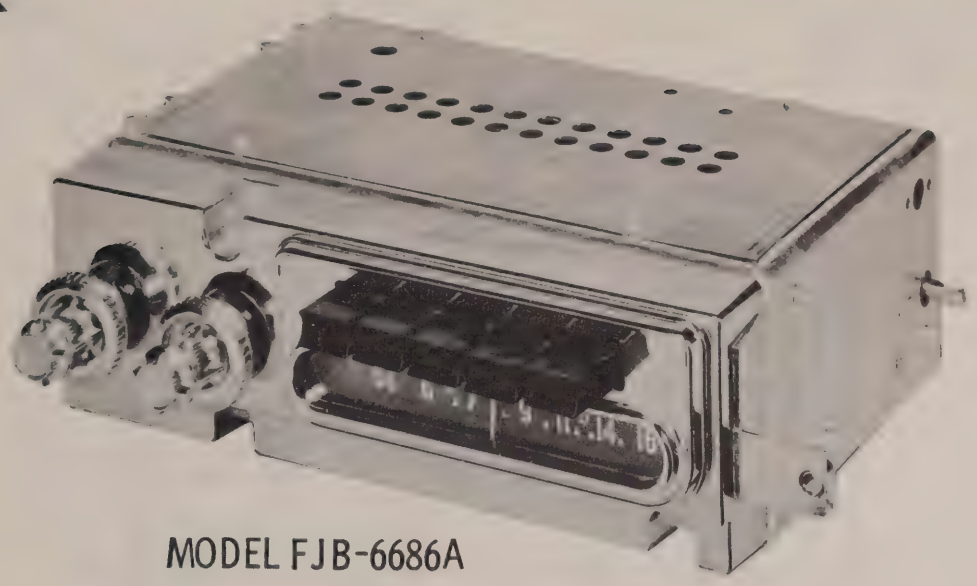
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

RIVERSIDE MODELS
FJB-6686A, FJB-6689A



MODEL FJB-6686A

TRADE NAME	Riverside Models FJB-6686A (Pushbutton), FJB-6689A (Manual) For 1959 Plymouth Automobiles
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1.7 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	538 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	265KC for Pushbutton Model. 455KC for Manual Model (400∿ Mod.)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1610KC	"	"	A5	"
3.	Fig. 1	Thru dummy to antenna receptacle	1610KC	"	"	A6	"
4.	"	"	"	"	"	A7	"
5.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull button out; depress firmly.
3. Repeat for remaining stations.

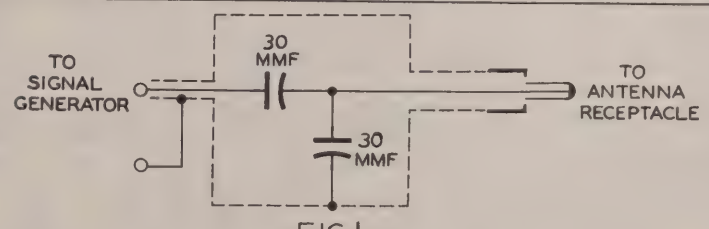


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JD480

SET 474 FOLDER 11

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12AF6 (12BL6) *	V3	IF Amplifier	12BL6 (12AF6) *
V2	Converter	12AD6	V4	Detector - AVC - Driver	12J8 (12DL8) *

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	1124B	Output	2N236B			2N242	PNP Note 1

Note 1. When replacing, apply Silicone grease (General Cement Z5 or equivalent) between transistor and chassis.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RIVERSIDE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■500	15	20-315	PWH2-02-75	B0045	WP200.7	TMS-10	TVLS-2155 *	
B	▲150	15					TD-250-15		
C2	750	3	20-757	SRE3V500	BR10006	PETA190	TD-1000-6	TVAS-1097 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3		#28-800K						
C4	40		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C7	12		DI-12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C8A		#28-4046						
B								
C	40		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C9	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	27		NPO-DI 27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C12	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30

\# Riverside Part Number.

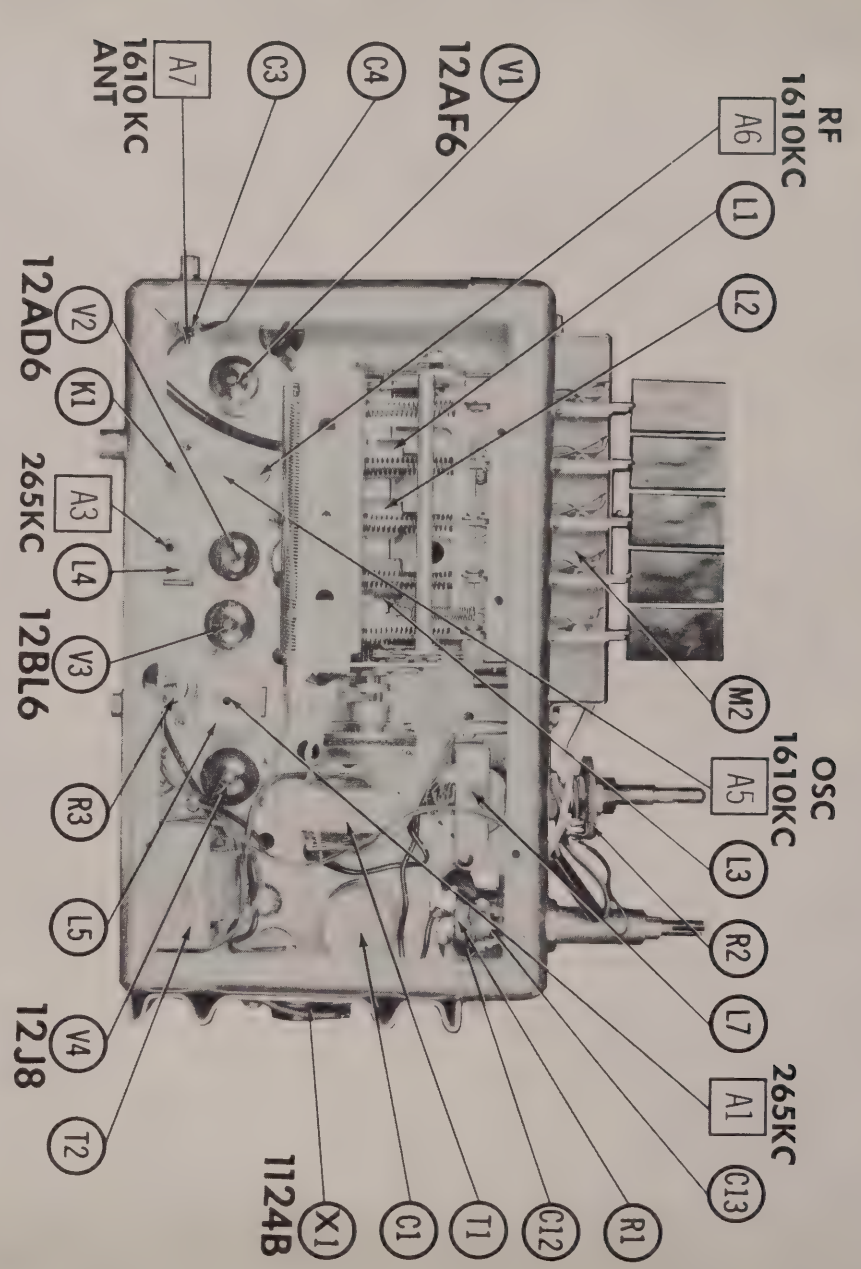
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RIVERSIDE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	80A1020	F1-68	RTV-689C	† QJ-1131A		Tone
B	1meg 600K tap	½		R2-60	Not Req.			Volume
C	Switch			KR-4	Not Req.			Power Off-On
D	Bushing			AK-28	XB-1			
R2	25Ω	2(WW)	80A1022					Speaker Fader Note 1
R3	500Ω 100Ω stop	1(WW)	62-501		39-500-100	112-500-100	FL-600S	Bias

† "Concentrikit" Equivalent: K-8 Kit With base elements and shafts: B13-139, P14-121 (Panel) B19-137X, R1-205 (Rear) 76-1 (Switch) S-24 (Bushing)

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1500Ω	
R5	150K	
R6	120Ω	(330Ω) *
R7	4.7meg	
R8	2.2meg	

ITEM No.	RATING	REMARKS
R9	1.2meg	
R10	47K	
R11	10meg	
R12	10meg	
R13	47K	

ITEM No.	RATING	REMARKS
R14	100K	
R15	10meg	(3.3meg) *
R16	1Ω 1W	
R17	22Ω	
R18	68Ω	

* Alternate

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RIVERSIDE PART No.	REPLACEMENT DATA
K1	Antenna Isolation	100mmf, 1.2meg	89-4204	Sprague PRC-9

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: RIVERSIDE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Antenna Coil	†						
L2	RF Coil	†						
L3	Osc. Coil	†						
L4	Input IF	14-265 ①	16-6752	16-6752	BC-350	12-H1	RF-3	
L5	Output IF	14-267 ①	16-6754	16-6754	BC-354	12-H6		
L6	"A" Lead Choke							1.2uh

† Part of M2.

① Manual tuning receivers use Part #14-1655-6/X.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	1.5A	.9Ω	.008 Hy.	75A601						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO: PRI.	SEC.	REPLACEMENT DATA: RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	15	1	75A602A ①						① Alternate Part #75-459

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	REPLACEMENT DATA: RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	22Ω Tap ② 3-4Ω	75-966							

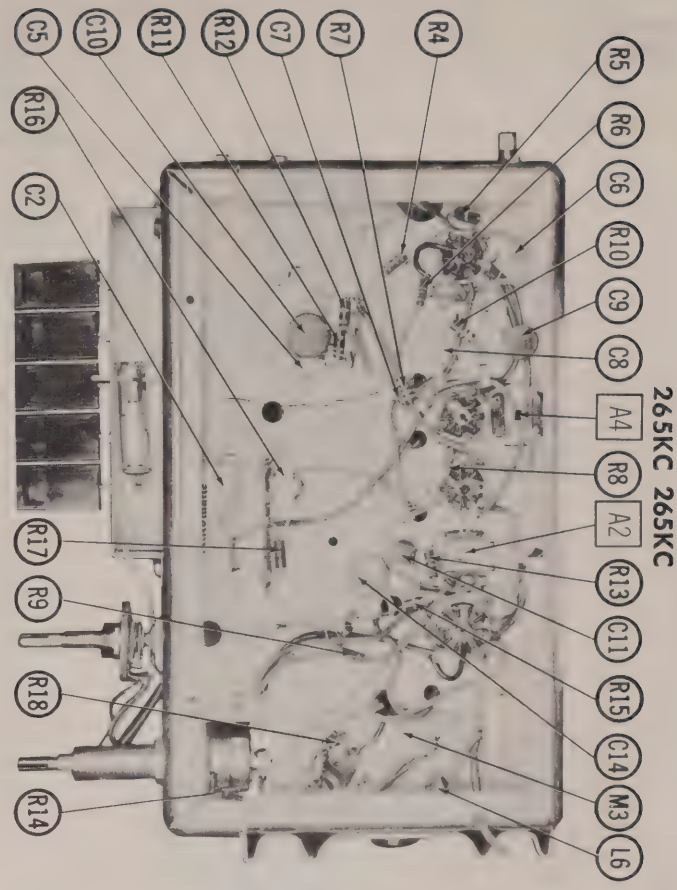
SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: RIVERSIDE PART No.	QUAM PART No.	NOTES
SP1	5" x 7"	PM	3-4Ω	73A654	57A21	① Part #73-656 used in some versions.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: RIVERSIDE PART No. FUSE	RIVERSIDE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	SFE	7½A 32V			30707.5 (SFE 7½A 32V)	155009	SFE 7½	HDH

CHASSIS—BOTTOM VIEW



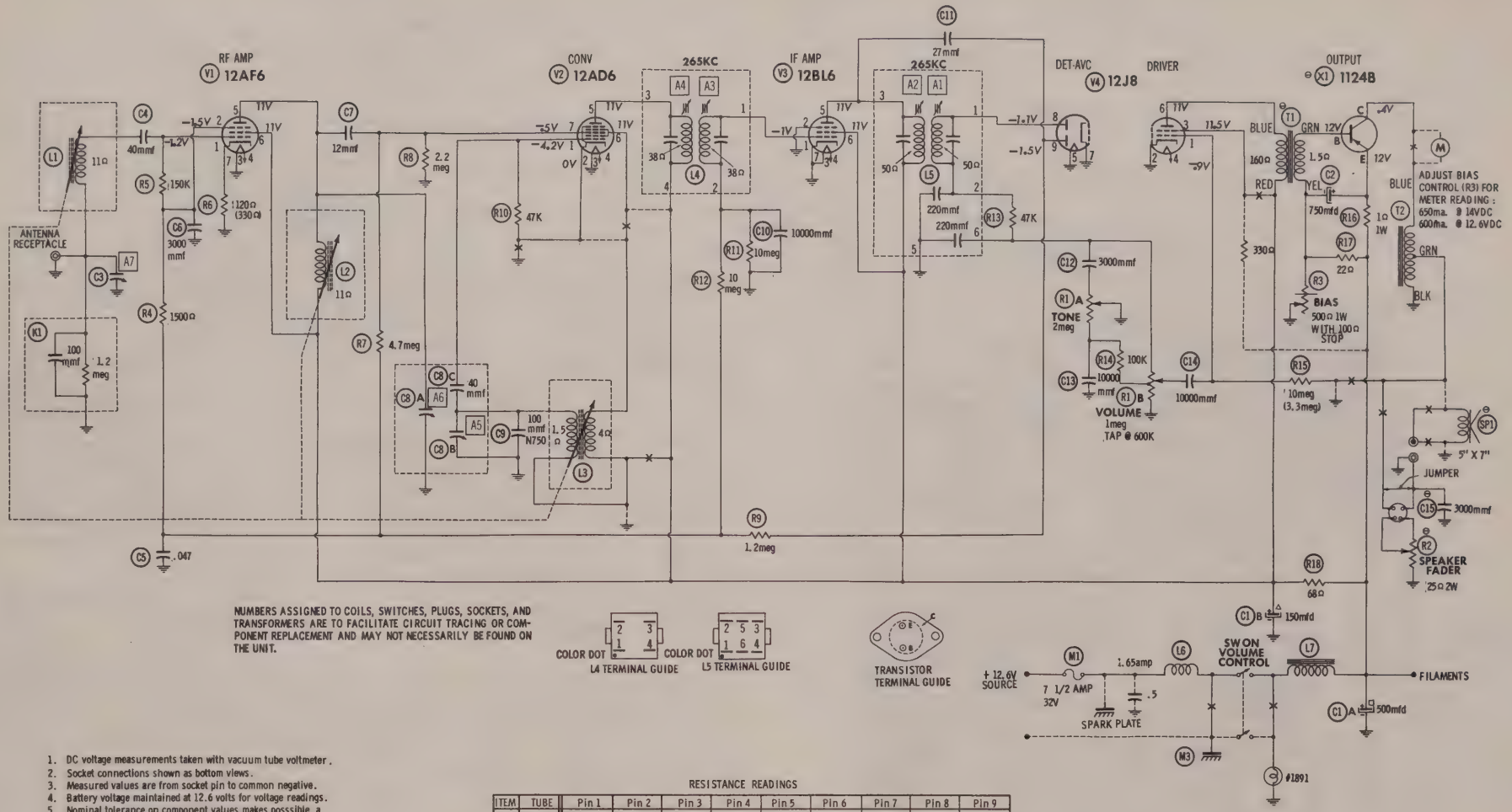
MISCELLANEOUS

ITEM No.	PART NAME	RIVERSIDE PART No.	NOTES
M2	Tuner	78B1017/1028	Pushbutton (Specify Number)
	Tuner	78B1028	Pushbutton
	Tuner	78A1147	Manual
M3	Spark Plate		

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	48A1013	Tuning, Volume
Knob	48A1012	Tone, Dummy
Escutcheon	54C1014	Pushbutton
Escutcheon	54C1014-1	Manual



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AF6	5.5meg	5.4meg	0Ω	1.7Ω	75Ω	68Ω	120Ω		
V2	12AD6	47K	0Ω	0Ω	1.7Ω	100Ω	75Ω	2.2meg		
V3	12BL6	7meg	0Ω	0Ω	1.7Ω	120Ω	68Ω	0Ω		
V4	12J8	10meg	0Ω	68Ω	1.7Ω	0Ω	230Ω	0Ω	1meg	6.5meg

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RIVERSIDE MODELS
FJB-6686A, FJB-6689A

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

RIVERSIDE
MODEL FJB-6690A

RIVERSIDE
MODEL FJB-6690A

RIVERSIDE
MODEL FJB-6690A

TRADE NAME	Riverside Model FJB-6690A (For 1959 Buick Automobiles)
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1.6 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	538 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	265KC (400~ Mod.)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1610KC	"	"	A5	"
3.	Fig. 1	Thru dummy to antenna receptacle	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull button out, then depress firmly.
3. Repeat for remaining buttons.

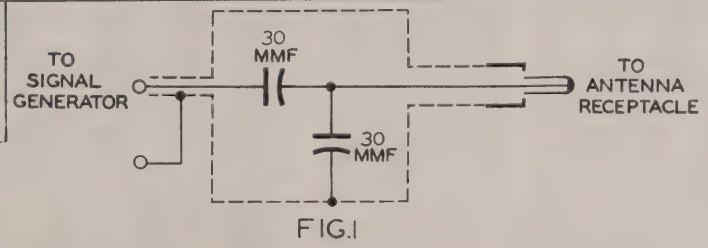

FIG.1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JD481

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SET 474 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12AF6 (12BL6) *	V3	IF Amplifier	12BL6 (12AF6) *
V2	Converter	12AD6	V4	Det. - AVC - AF Amp.	12AE6 (12FT6) *

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N363	Driver			2N363	2N406	PNP Note 1
X2	CT1124	Output	2N285A			2N242	PNP Note 1

Note 1. When replacing transistor, apply Silicone grease (General Cement Z5 or equivalent) between the transistor and chassis.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RIVERSIDE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■500	15	20-315	PWH2-02-75	B0045	WP200.7	TMS-10	TVLS-2155 *	
B	▲150	15					TD-250-15		
C2	750	3	20-757	SRE3V500	BR1000-6	PETA190	TD-1000-6	TVAS-1097 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3		#28-800K						
C4	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C7	12		DI-12	DD-120	L10Q12	CCTO-120	CNO-412	10TCC-Q12
C8A								
B		#28-4046						
C	40		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C9	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	27 NPO		NPO-DI 25	TCZ-27	C10Q27C	CCTO-271	CNO-427	10TCC-Q27
C12	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	.47 100V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47

Riverside Part Number.

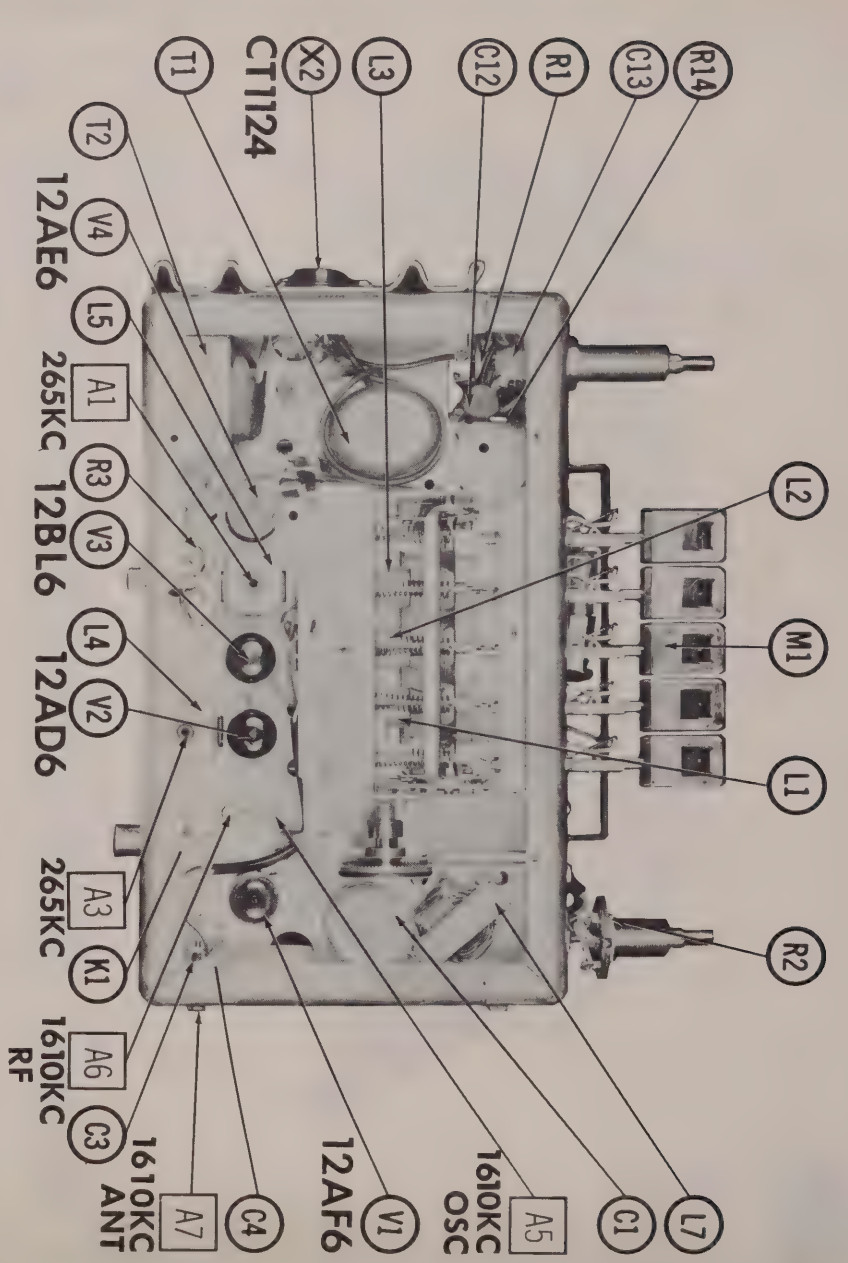
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RIVERSIDE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	80A1150	F1-68				Tone Note 1
B	1meg 400K tap	½		R2-60		† QJ-1133A		Volume
C	Switch			KR-7				Power Off-ON
D	Bushing			AK-28				
R2	25Ω	2(WW)	80A1151					Speaker Fader
R3	500Ω	2(WW)	62-501		39-500-100	112-500-100	FL600S	Bias

Note 1. Some versions may use Part #80A1140.

† "Concentrikit" Equivalent: K-8 Kit with base elements and shafts: B13-139, P13-122 (Panel)
B19-137X, R1-202 (Rear
76-2 (Switch)
S-25 (Bushing)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1500Ω	
R5	150K	
R6	330Ω	
R7	4.7meg	
R8	2.2meg	
R9	1.2meg	
R10	47K	

ITEM No.	RATING	REMARKS
R11	10meg	
R12	10meg	
R13	47K	
R14	100K	
R15	2.2meg	
R16	6800Ω	
R17	120Ω	

ITEM No.	RATING	REMARKS
R18	12K	
R19	220Ω	
R20	470K	
R21	1Ω 5% 1W	
R22	22Ω	
R23	330Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RIVERSIDE PART No.	REPLACEMENT DATA
K1	Antenna Isolation	100mmf, 1.2meg	89-4204	Sprague PRC-9

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		RIVERSIDE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Antenna Coil	†						
L2	RF Coil	†						
L3	Osc. Coil	†			BC-393			
L4	Input IF	14-265X	16-6752	16-6752	BC-350	12-H1	RF-3	
L5	Output IF	14-267X	16-6754	16-6754	BC-354	12-H6		
L6	"A" Lead Choke							1.2uh ①

† Part of M1. ① Not used in some versions.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	1.5A	.9Ω	.008 Hy.	75A601						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8	1	75A702C						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	22Ω Tap ② 3-4Ω	75A966							

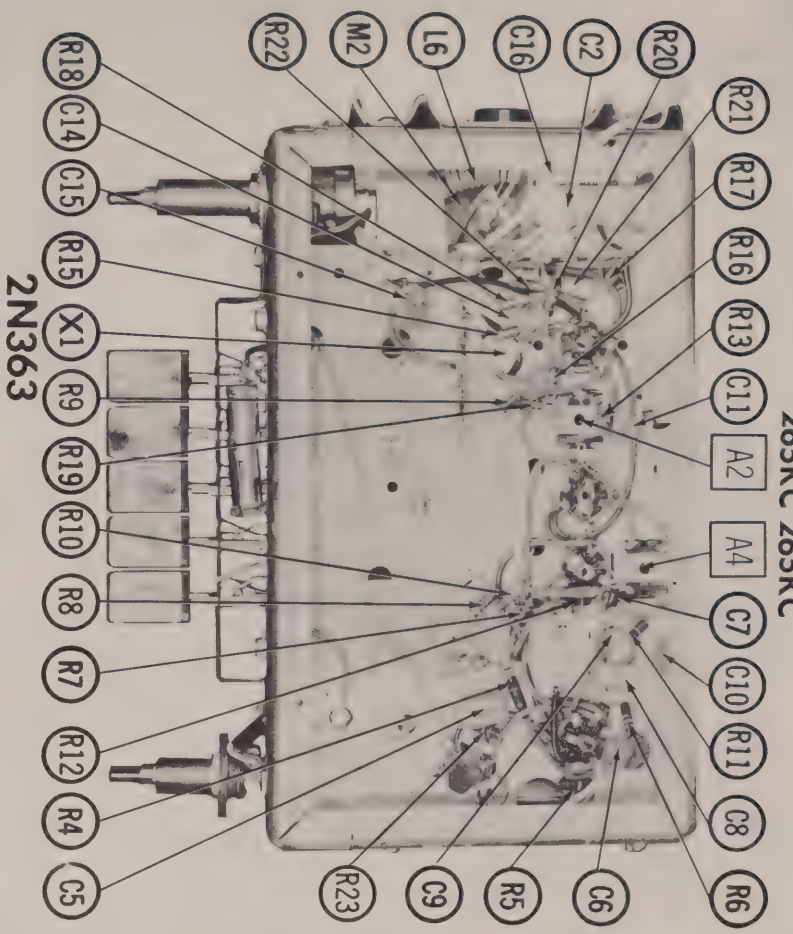
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RIVERSIDE PART No.	QUAM PART No.	
SP1	5" x 7"	PM	3-4Ω	73B654X	57A21	

MISCELLANEOUS

ITEM No.	PART NAME	RIVERSIDE PART No.	NOTES
M1	Tuner	78B1152	Pushbutton
M2	Spark Plate		

CHASSIS—BOTTOM VIEW



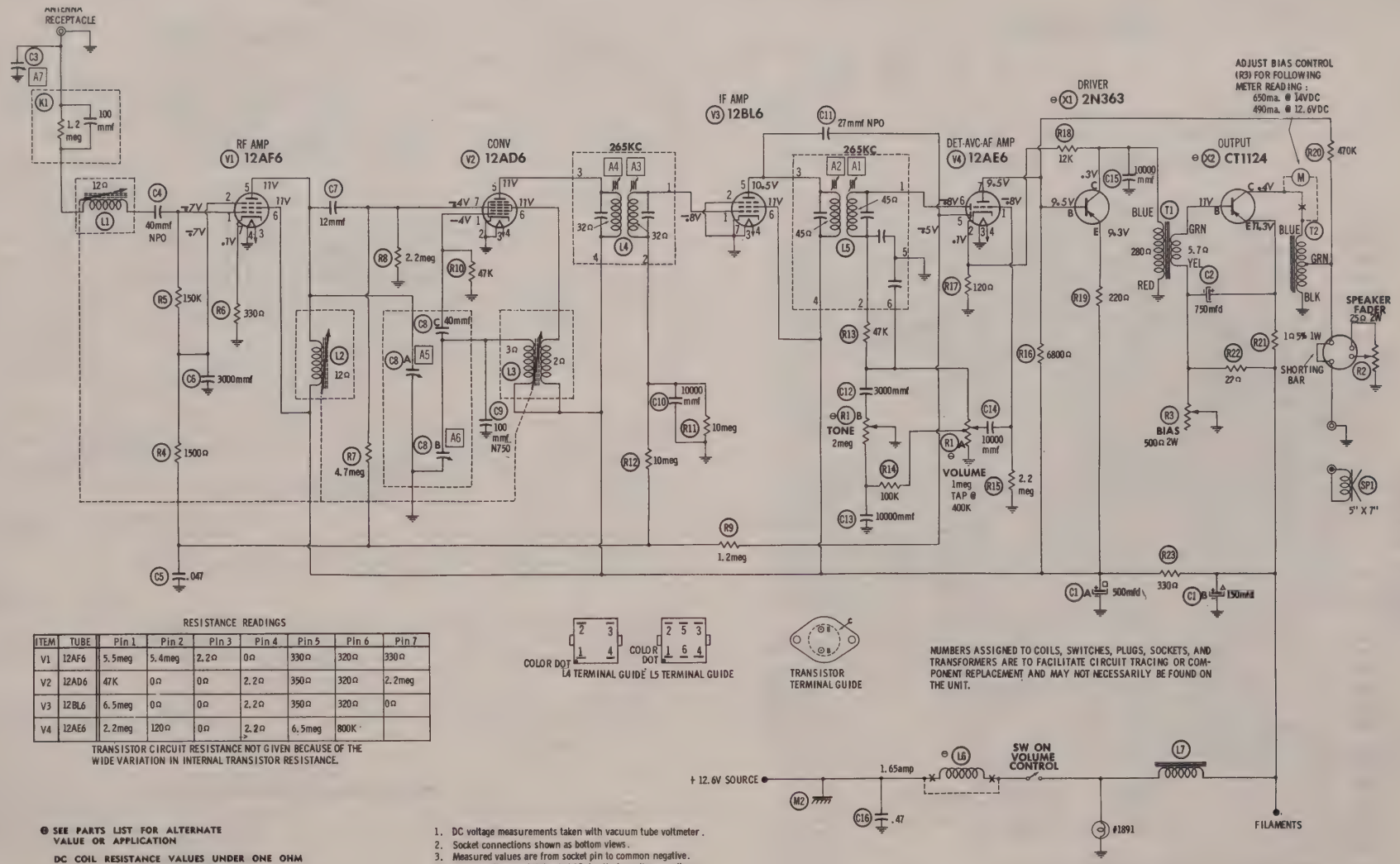
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	48A1037	Tuning, Volume
Knob	48A1038	Tone, Dummy
Escutcheon	54C1118	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AF6	5.5meg	5.4meg	2.2Ω	0Ω	330Ω	320Ω	330Ω
V2	12AD6	47K	0Ω	0Ω	2.2Ω	350Ω	320Ω	2.2meg
V3	12BL6	6.5meg	0Ω	0Ω	2.2Ω	350Ω	320Ω	0Ω
V4	12AE6	2.2meg	120Ω	0Ω	2.2Ω	6.5meg	800K	

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

L4 TERMINAL GUIDE L5 TERMINAL GUIDE

TRANSISTOR TERMINAL GUIDE

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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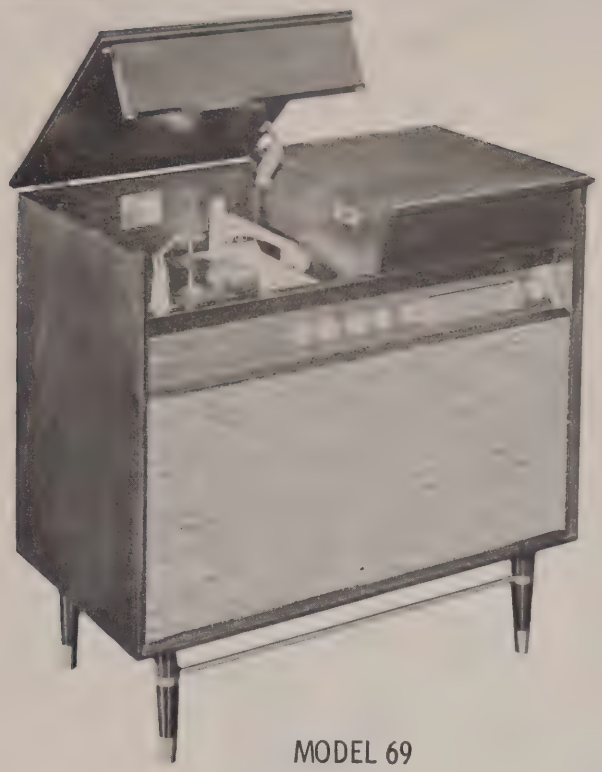
RIVERSIDE MODEL FJE-6690A

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER

SILVERTONE MODELS 69, 70, 71
(Ch. 528.53560, .59440, .59460)

SILVERTONE MODELS 69, 70, 71
(Ch. 528.53560, .59440, .59460)



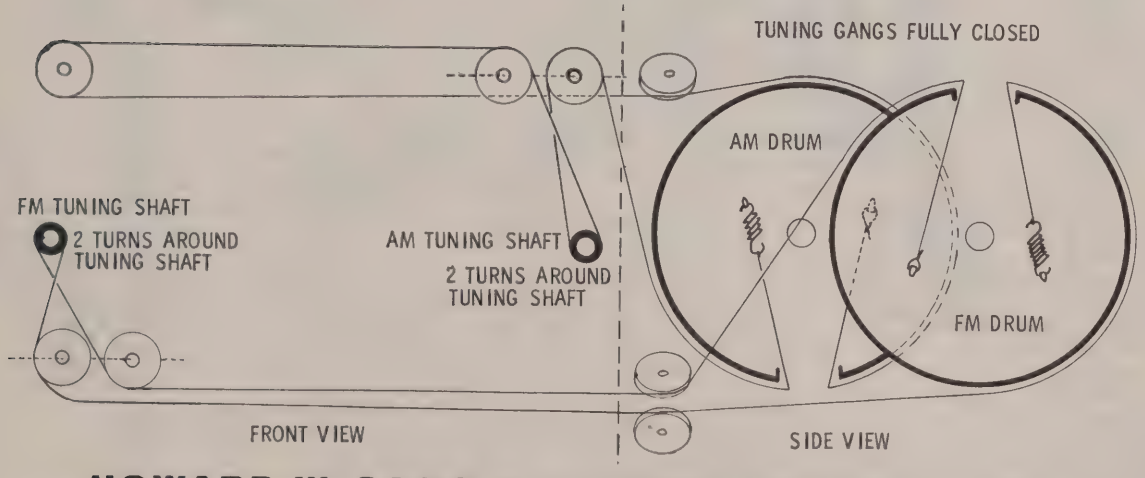
MODEL 69

SILVERTONE MODELS 69, 70, 71
(Ch. 528.53560, .59440, .59460)

TRADE NAME	Silvertone Models 69, 70, 71 (Chassis: Tuner 528.53560, Amp. 528.59440, Preamp. 528.59460)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	AC Operated 16 Tube FM-AM Receiver With 4 Speed Automatic Stereo Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	135 Watts, 1.3 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 532 - 1630KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER 528.56760 OR 528.56761 - SEE SILVERTONE 528.56310 - PHOTOFACT SET 417 FOLDER 10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JN636

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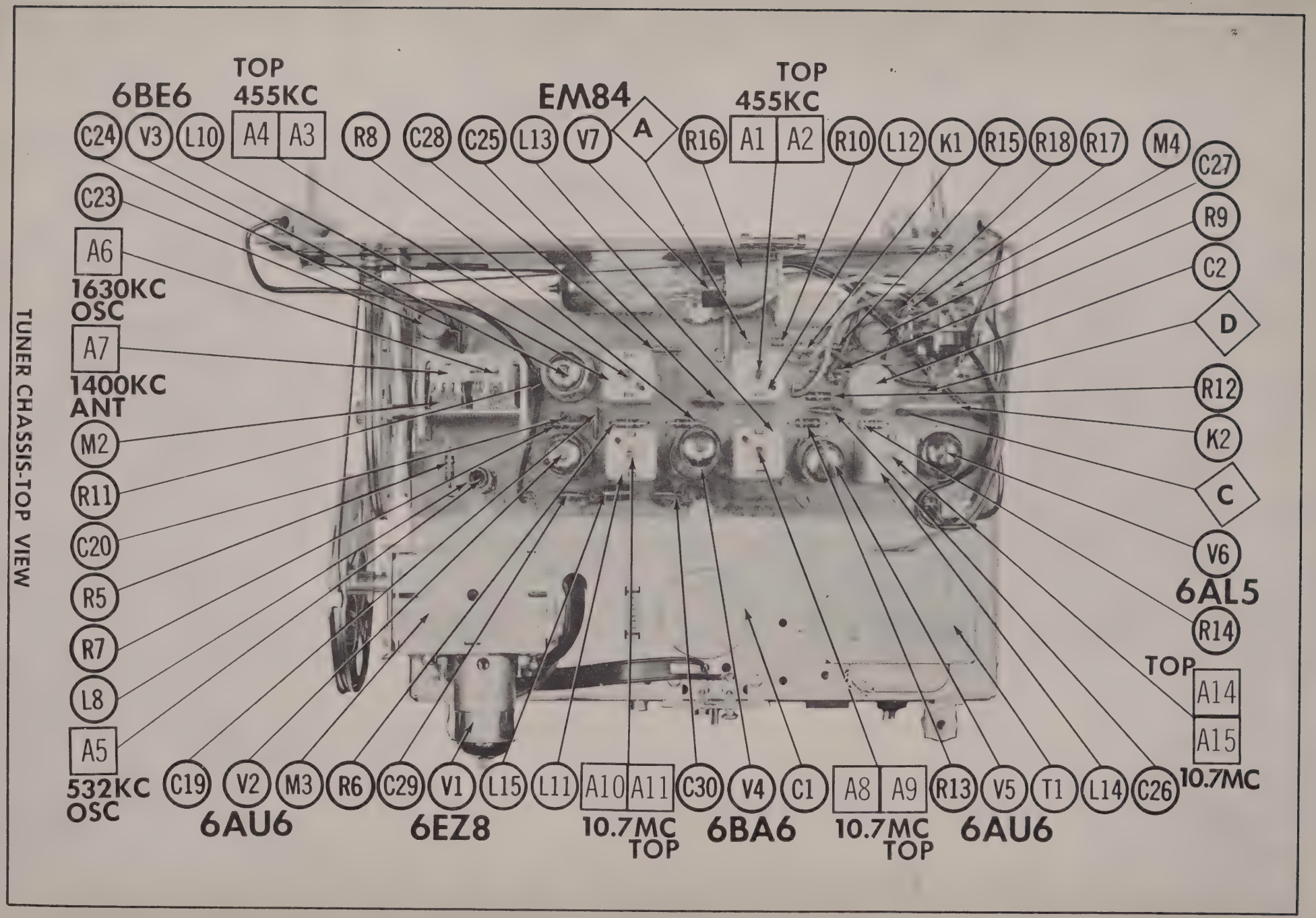


TUNER CHASSIS-TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4, A8 thru A15 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A6, A7, A16 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A17 ..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	532KC	"	Tuning gang fully closed	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1630KC	"	Tuning gang fully closed	"	A6	Adjust for maximum output. Repeat steps 2 and 3 until no further improvement is noted.
4.		"	1400KC	"	Tune to 1400KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.01mfd	High side to point (B). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A14	"
7.	"	"	"	"	"	DC probe to point (D). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.01mfd	High side to point (B). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A14	Disconnect Stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C2.
7.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead.	108MC (Unmod.)	FM	108MC	DC probe to point (A). Common to chassis.	A16	Adjust for maximum deflection.
9.	"	"	88MC	"	88MC	"	A17	"

FIG. 1

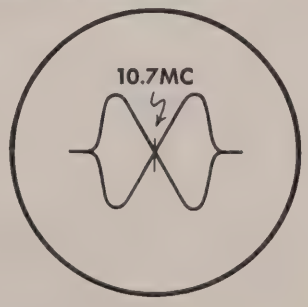


FIG. 2

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V1	FM RF Amplifier -	
	FM Mixer - Osc.	6EZ8
V2	1st FM IF Amplifier	6AU6
V3	AM Converter	6BE6
V4	2nd FM IF Amplifier -	
	AM IF Amplifier	6BA6
V5	FM Limiter -	
	AM Det. - AVC	6AU6
V6	FM Ratio Det.	6AL5
V7	Tuning Indicator	EM84 (6FG6) *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	150	18-57-3	AFH3-11-40	XC0123	FP330.9	TMQ-136	TVL-3443.2	
B	■60	150		MW-4					
C	▲40	150							
C2	8	50	18-98-5	PRS-1405	BBR8-150	TC41	TD-8-150	TVA-1405	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	1.5	#274-159						
C4	180	#277-181						
C5	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C8	8		NPO-DI 8.2	DD-080	C10V8C			10TS-V80
C9	1000		EF-001	MFT-1000		CCF-102	CT280A	
C10	33	#275-330						
C11	1.5	#274-159						
C12								
C13	4		NPO-DI 4.7	TCZ-4R7	C10V4C	CCTO-4R7	CNO-547	10TCC-V47
C14	33		DI-33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C15	500		1467-0005	DD-501	1R5T5	CM-20B-501M	MC245	MS-35
C16	1.5	#274-159						
C17	1000		EF-001	MFT-1000		CCF-102	CT280A	
C18	1000		EF-001	MFT-1000		CCF-102	CT280A	
C19	5000	(10000mmf) †	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C20	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C21	3.9 10%	(4.7mmf) †			C10V4C			10TCC-V39
C22		#18-180-1						
C23	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-473	ACE6147	2SE-S47
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	10000	(5000mmf) †	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-473	ACE6147	2SE-S47
C28	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C29	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

\# Silvertone Part Number. † Alternate Value.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	82Ω	
R2	330K	
R3	39K	
R4	8200Ω	
R5	560Ω	
R6	1000Ω	
R7	82Ω	
R8	82Ω	
R9	3.3meg	
R10	2.2meg	
R11	18K	
R12	10K	
R13	82Ω	
R14	3.3meg	(4.7meg) *
R15	3.3meg	
R16	560K	
R17	470K	
R18	56K	
R19	390Ω 1W	
R20	390Ω 1W	

* Alternate Value

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Antenna Coil	3191 †						
L2	RF Choke	3192-8 †						
L3	RF Choke	300-2 †						
L4	RF Choke	301-11 †						
L5	RF Choke	3190-24 †						
L6	FM Osc. Coil	3197 †						
L7	Loopstick	84-7786						
L8	AM Osc. Coil	10-55-4						
L9	1st FM IF	3193 †						
L10	1st AM IF	10-116-2	16-6780	16-6780	BC-356	13-PC1	RF-4	
L11	2nd FM IF	10-117-2	16-3490	16-3490		1463-PC		
L12	2nd AM IF	10-116-2	16-6780	16-6780	BC-357	13-PC2	RF-4	
L13	3rd FM IF	10-118-2	16-3490	16-3490		1463-PC		
L14	Ratio Detector	10-29-0	17-3492	17-3492		1465-PC		
L15	Fil. Choke	10-28-0						

† Part of M5.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	AM Detector RF Filter	100mmf, 100mmf, 47K	13-2-2	Aerovox PA-97 Centralab PC-50 Cornell-Dubilier 111TM1 Sprague D-1
K2	Ratio Detector Network	(3) 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, (2) 6800Ω, 68K	13-35-3	Centralab PC-342

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② .33A	150V ② .035A	6.3V ② 2.3A	80-36-0						

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.033A	86-21-3 ①	RS065 ①	1234AH ①	65 ①	SR200 ②	① Selenium Type ② Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M2	Tuning Cap.	19-84-2	AM, 2 Gang
M3	Tuner	95-201-0	FM Complete
M4	Switch	69-294-0	Function Selector (Tuner)
M5	Switch	69-269-0	Automatic Power Control
	Printed Board	84-7803-0	Tuner (Less Tubes)
	Dial Pointer	52-216-1	
	Window	48-171-1	Dial Scale

PRE-AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V8	Channel A Preamp. - Channel B Preamp.	7025
V9	Channel A AF Amp. - Channel B AF Amp.	12AU7A

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C31A	▲20	350	18-58-3	AFH2-69	B0500	FP237	TMD-61	TVL-2935	
B	▲20	350							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C32	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34	820 10%		DI-820	DD-821	1R5T82	CCD-821	GP382	10TS-T82
C35	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C36	1500 10%		DI-1500	DD-152	1R5D15	CCD-152	GP215	10TS-D15
C37	100 10%		DI-100	DD-101	22R5T1	CCD-101	GP310	10TS-T10
C38	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S2
C39	3000 10%		DI-3000		1R5D3	CCD-302 *	JL-233	10TS-D30
C40	200 N1500	#15-20111						
C41	2000 10%		DI-2000		1R5D2	CCD-202	GP222	10TS-D20
C42	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C43	15000		BPD-015	DD-153	BYA10S15	CCD-153	B-115	5HK-S15
C44	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C45	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	820 10%		DI-820	DD-821	1R5T82	CCD-821	GP382	10TS-T82
C47	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C48	1500 10%		DI-1500	DD-152	1R5D15	CCD-152	GP215	10TS-D15
C49	100 10%		DI-100	DD-101	22R5T1	CCD-152	GP310	10TS-T10
C50	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C51	3000 10%		DI-3000		1R5D3	CCD-302 *	JL-233	10TS-D30
C52	200 N1500	#15-20111						
C53	2000 10%		DI-2000		1R5D2	CCD-202	GP222	10TS-D20
C54	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C55	15000		BPD-015	DD-153	BYA10S15	CCD-153	B-115	5HK-S15
C56	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

Silvertone Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R21A	2meg 500K Tap 1meg Tap	½	24-358-0					Loudness, Channel A
B	2meg 500K Tap 1meg Tap	½						Stereo Balance, Channel B
R22A	1meg	½	24-203-2	F1-52		† QJ-1132R	■ UE4068	Bass, Channel A
B	1meg	½		R2-52				Stereo Bass, Channel B
R23A	1meg	½	24-202-2	F1-54		† QJ-1132R	■ UE4068	Treble, Channel A
B	1meg	½		R2-54				Stereo Treble, Channel B

† "Concentrikit" Equivalent: K-6 Kit With Base Elements & Shafts: B13-137, P17-028 (Panel)
Not available as a factory assembled unit. B13-137, R9-110 (Rear)
■ "STA-LOC" Equivalent: FA16A, RU16A, OS875A, IS1375.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R24	47K	
R25	1.5meg	
R26	4.7meg	
R27	470K	
R28	100K	
R29	10K	
R30	47K	

ITEM No.	RATING	REMARKS
R31	47K	
R32	470Ω	
R33	47K	
R34	1.5meg	
R35	4.7meg	
R36	470K	
R37	100K	

ITEM No.	RATING	REMARKS
R38	10K	
R39	47K	
R40	47K	
R41	470Ω	
R42	22K 1W	
R43	22K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K3	Left Channel Loudness Compensator	18mmf, 27mmf, 3300mmf, 4700mmf, 47K, 68K, 330K	13-19-3	
K4	Left Channel Rumble Filter	(2) 4000mmf, 8000mmf, 500K, (2) 1meg	13-37-3	
K5	Right Channel Loudness Compensator	18mmf, 27mmf, 3300mmf, 4700mmf, 47K, 68K, 330K	13-19-3	
K6	Right Channel Rumble Filter	(2) 4000mmf, 8000mmf, 500K, (2) 1meg	13-37-3	

PHONO CARTRIDGE

ITEM No.	SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M6	33-314-0	13TB	Not Req.	66 †	Not Req.			8TA4-S	N-8TA-S

† Use Mount PT-3.

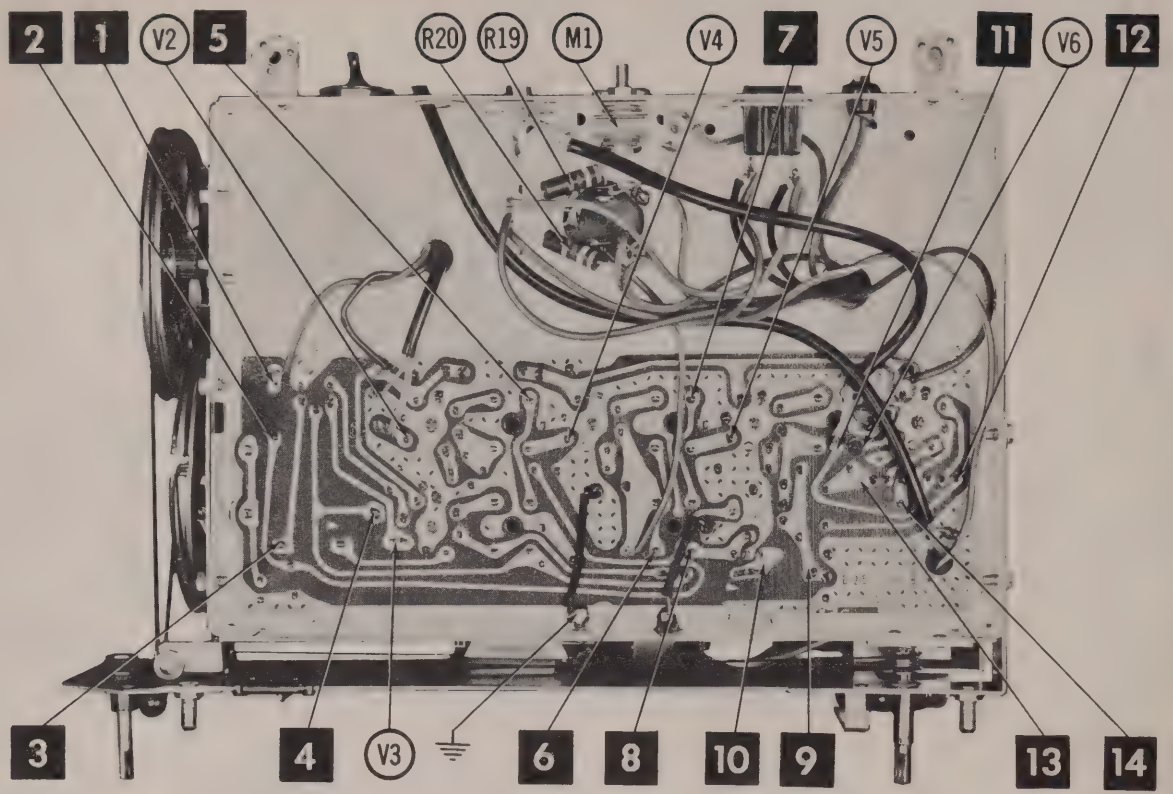
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M7	83-1308 ♦†	W-103STSS † or W-103STDS †♦	CS-1X † or CS-1XD †♦	† Jewel ♦ Diamond

MISCELLANEOUS

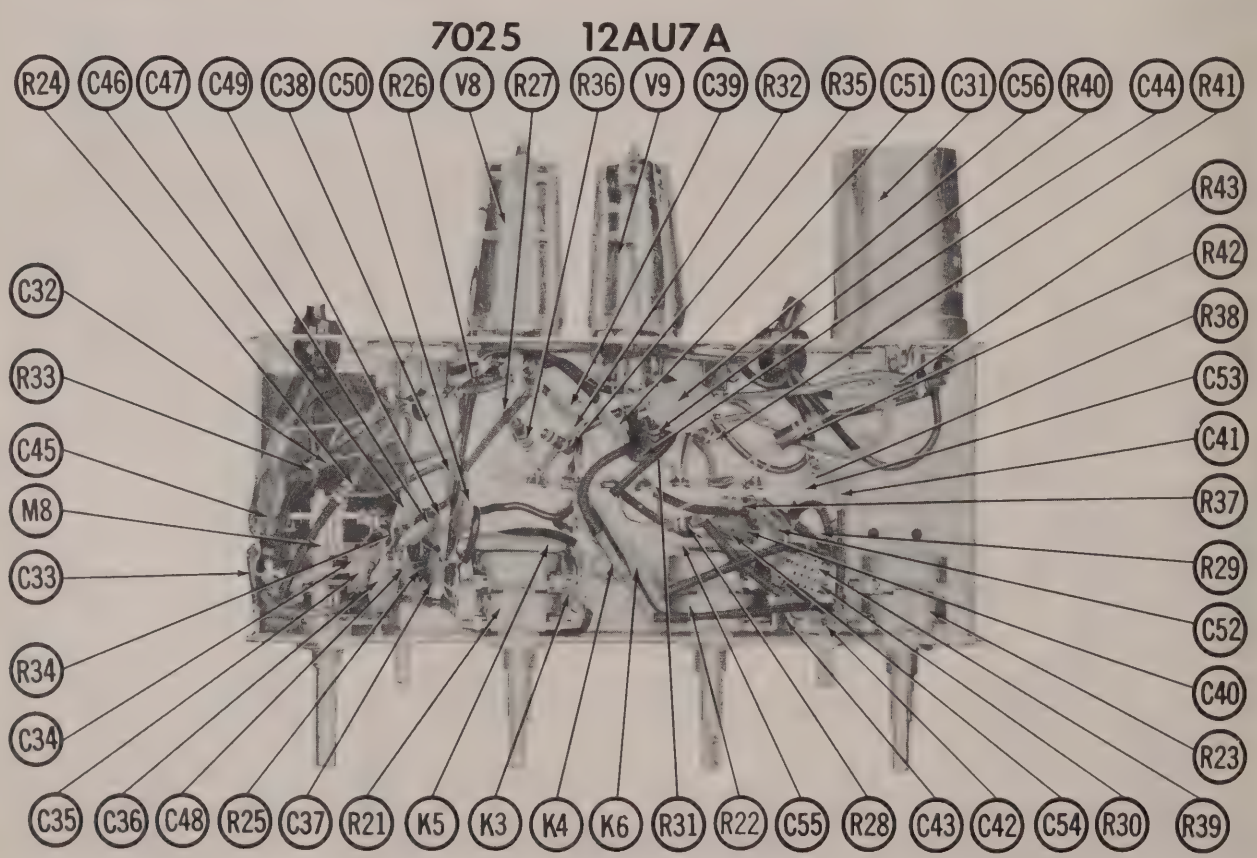
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Switch	69-298-0	Function Selector
M9	Switch	69-282-0	Stereo-Monaural (Part of Changer)
M10	Switch	84-7838	Off-On (Includes Spring, Part of Changer)
M11	Solenoid	27-74-2	Part of Changer
M12	Motor	59-89	Turntable Drive (Chassis 528.56761)
	Motor	59-72	Turntable Drive (Chassis 528.56760)



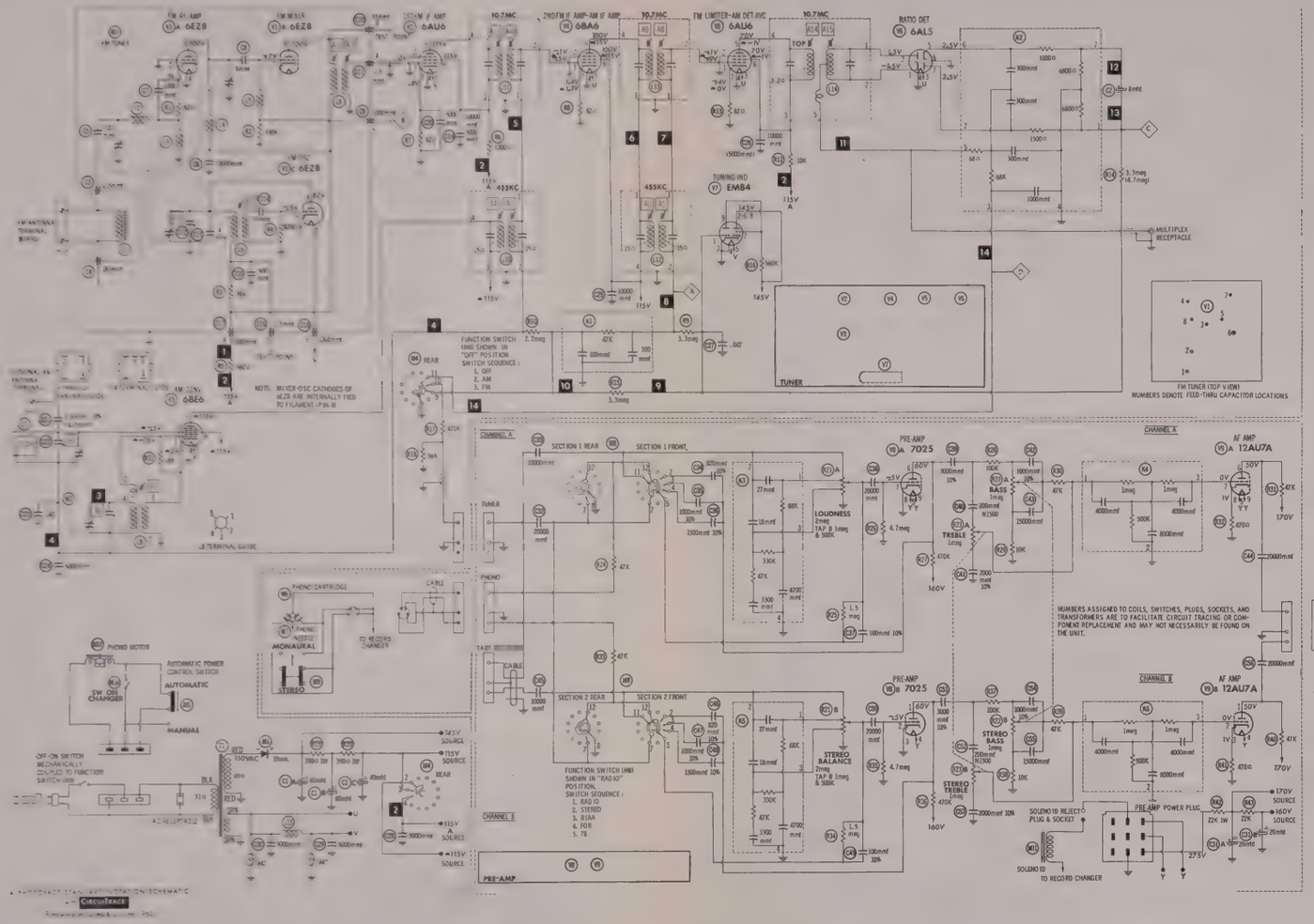
A Howard W. Sams CIRCUITRACE* Photo

TUNER PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PREAMP CHASSIS



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6EZ8	820Ω	0Ω	†1350Ω	0Ω	1Ω	†1350Ω	330K	†40K	820Ω
V2	6AU6	1Ω	0Ω	1Ω	0Ω	†1850Ω	†1850Ω	82Ω		
V3	6BE6	18K	7Ω	1Ω	0Ω	†-780Ω	†-780Ω	*2.7meg		
V4	6BA6	2.2meg *2.2meg *47K	0Ω	1Ω	0Ω	†78Ω	†78Ω	82Ω		
V5	6AL6	0Ω	1Ω	0Ω	†30K	†30K	82Ω			
V6	6AL5	540K	540K	1Ω	0Ω	78000Ω	0Ω	83000Ω		
V7	EM84	1.2meg	†0Ω	0Ω	0Ω	1Ω	†0Ω	†560K	†0Ω	†560K
V8	7025	††515K	4.7meg	0Ω	50Ω	50Ω	††515K	4.7meg	0Ω	50Ω
V9	12AU7A	††70K	2meg	470Ω	50Ω	50Ω	††70K	2meg	470Ω	50Ω
V10	7025	††300K	220K	1000Ω	50Ω	50Ω	††300K	††320K	100K	50Ω
V11	6V6GT	NC	50Ω	††320Ω	††1300Ω	270K	NC	50Ω	250Ω	
V12	6V6GT	NC	50Ω	††320Ω	††1300Ω	270K	NC	50Ω	250Ω	
V13	7025	††320K	220K	1000Ω	50Ω	50Ω	††300K	††320K	100K	50Ω
V14	6V6GT	NC	50Ω	††320Ω	††1300Ω	270K	TP	50Ω	250Ω	
V15	6V6GT	NC	50Ω	††320Ω	††1300Ω	270K	NC	50Ω	250Ω	
V16	5U4GB	NC	¶	NC	360	NC	360	NC	¶	

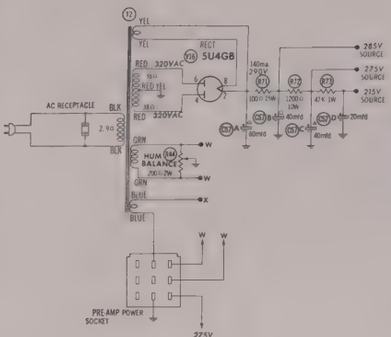
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM OUTPUT OF M1.
†† MEASURED FROM PIN 2 OF V16.
* MEASURED IN "AM" POSITION.

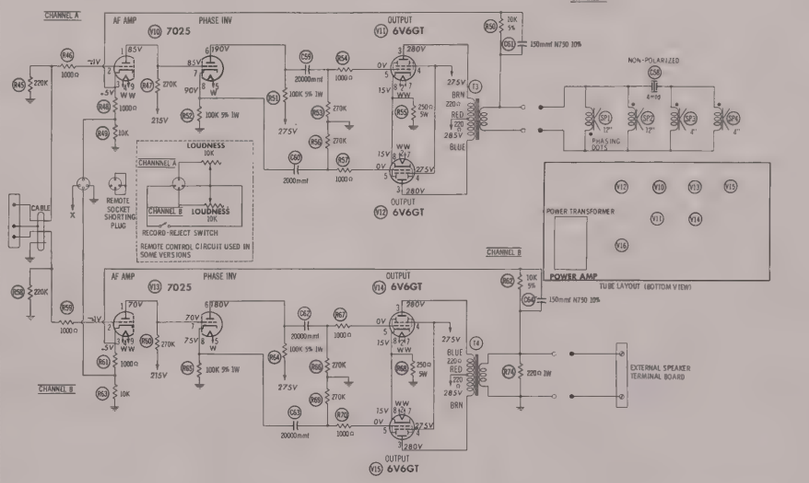
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

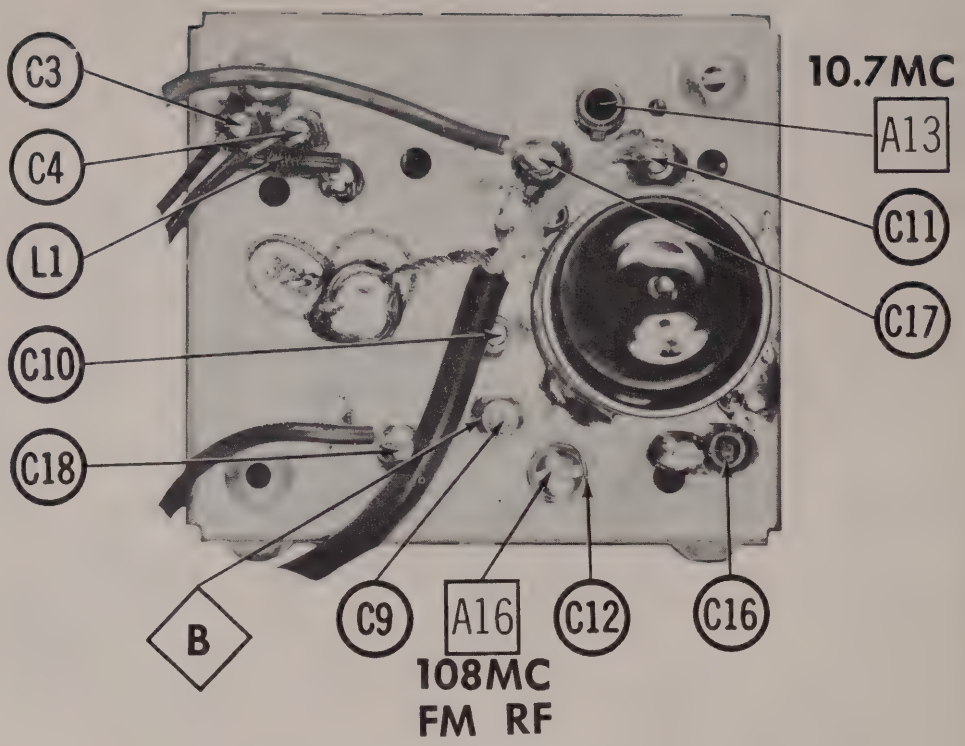
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

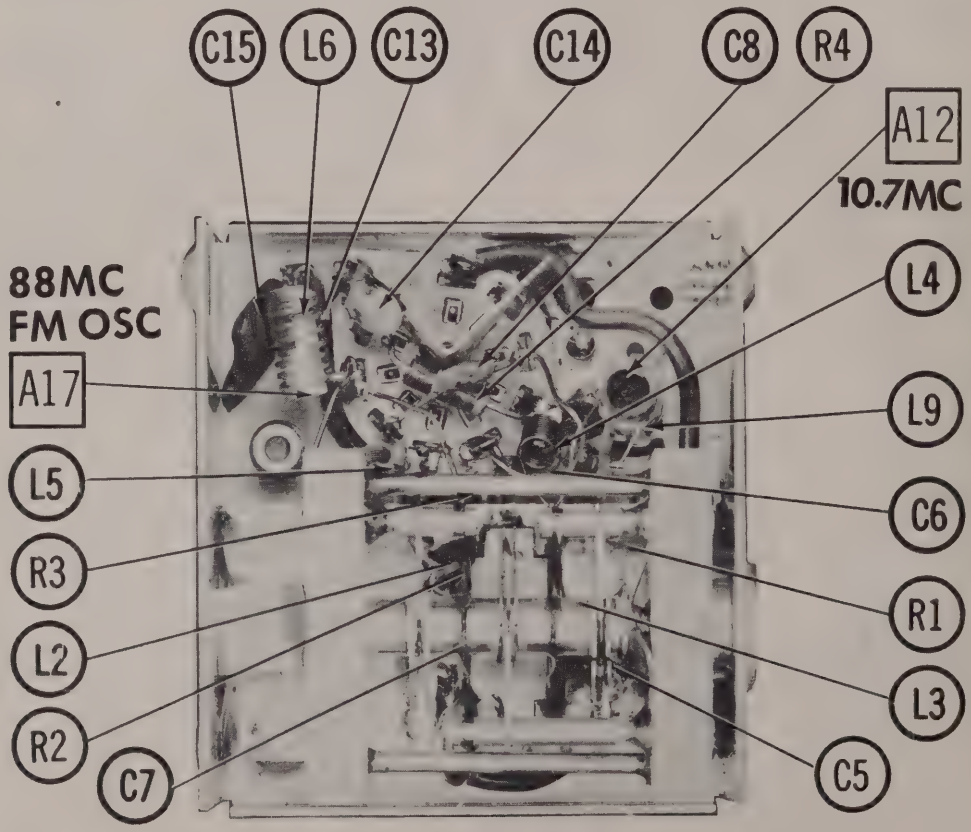




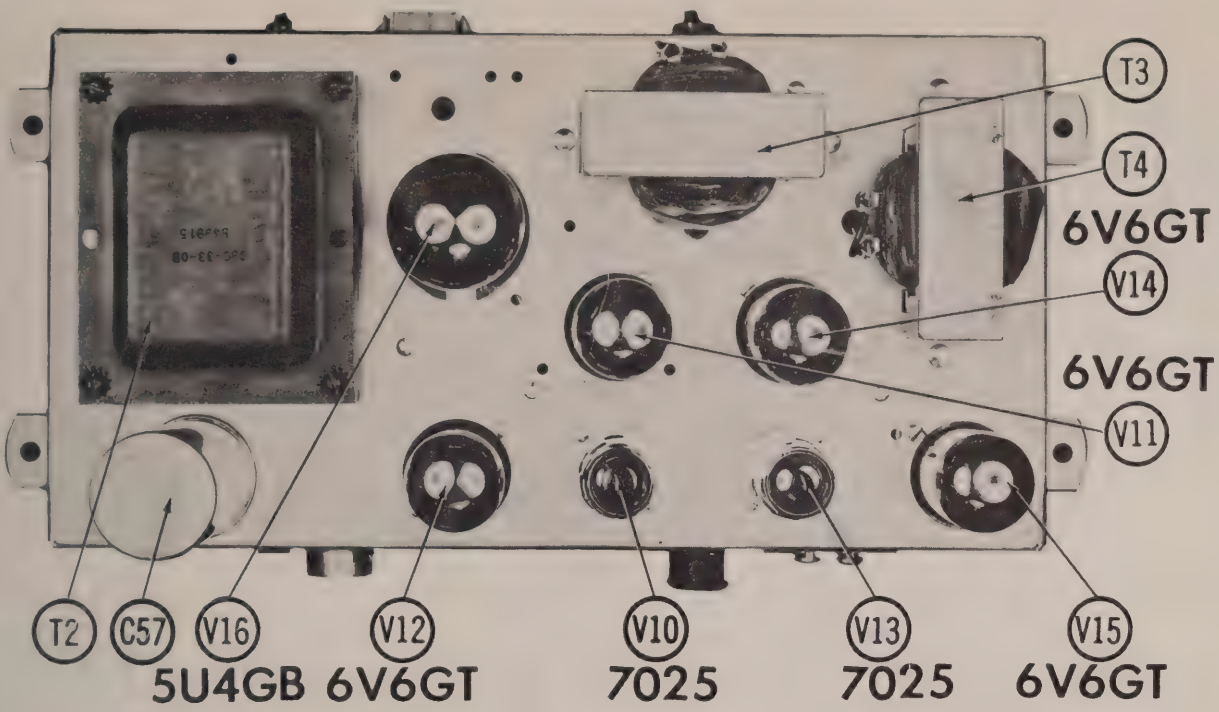
SILVERTONE MODELS 69, 70, 71
(Ch. 528.53560, .59440, .59460)



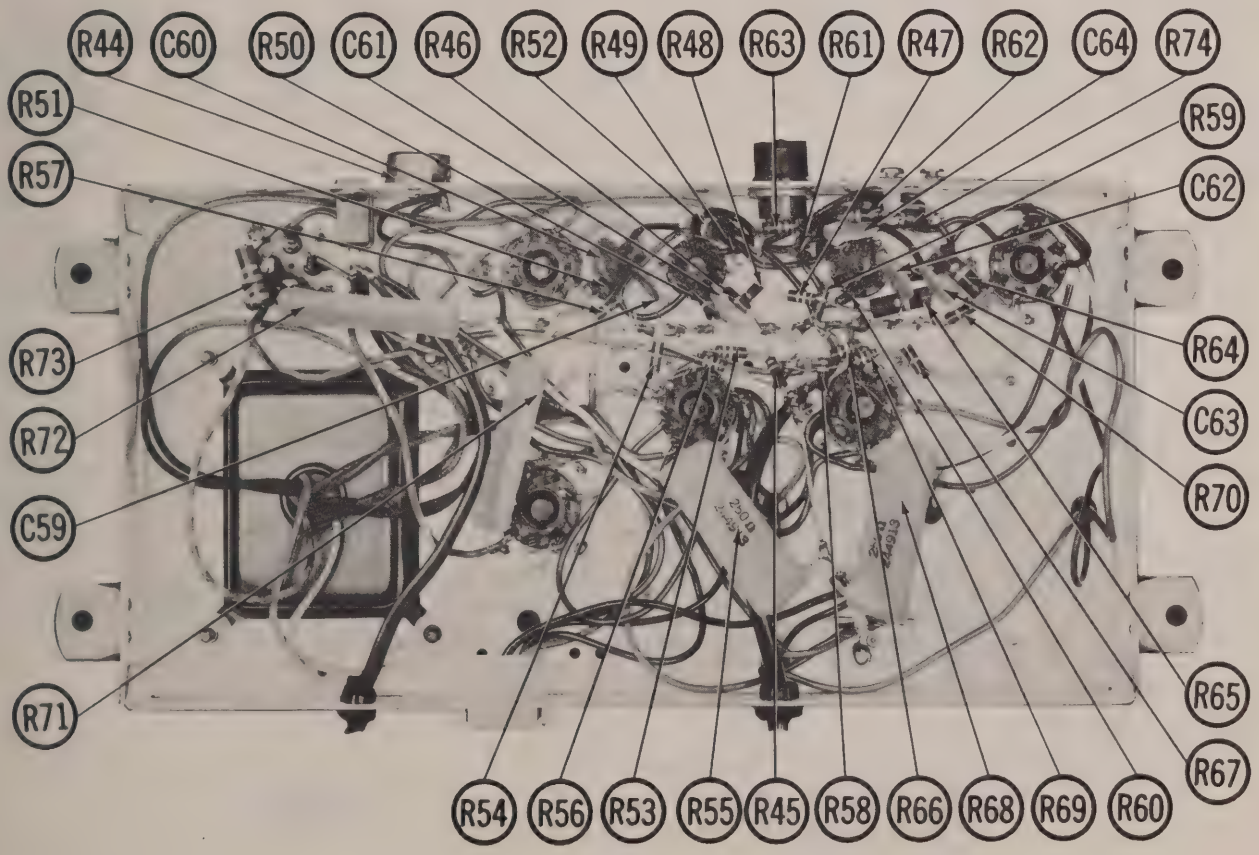
FM RF SUBCHASSIS - TOP VIEW



FM RF SUBCHASSIS - BOTTOM VIEW



AMP CHASSIS - TOP VIEW



AMP CHASSIS - BOTTOM VIEW

AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V10	Channel A AF Amp. - Phase Inverter	7025
V11	Channel A Output	6V6GT
V12	Channel A Output	6V6GT
V13	Channel B AF Amp. - Phase Inverter	7025
V14	Channel B Output	6V6GT
V15	Channel B Output	6V6GT
V16	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C57A	▲60	450	18-55-3		C0365	FP376.9	TMT-193	TVL-3791	
B	■40	450			BR-4035	TC795	TD-40-350	TVA-1611	
C	▲40	350							
D	20	300							
C58	4	150VNP	18-9-5	NP-PRS1750	BBR8-150 ‡	TCN510		TVAS-1402.1*	

‡ Use printed circuit adaptor #55277 and 55278.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C59	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C60	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C61	150 N750 10%		N750-DI 150	DTN-150	C10T15U	CCTN-151	CN7-315	10TCU-T15
C62	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C63	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C64	150 N750 10%		N750-DI 150	DTN-150	C10T15U	CCTN-151	CN7-315	10TCU-T15

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R44	200Ω	2(WW)	24-1-3				FL200P	Hum Balance

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R45	220K	
R46	1000Ω	
R47	270K	
R48	1000Ω	
R49	10K	
R50	10K 5%	
R51	100K 5% 1W	
R52	100K 5% 1W	
R53	270K	
R54	1000Ω	

ITEM No.	RATING	REMARKS
R55	250Ω 5W	
R56	270K	
R57	1000Ω	
R58	220K	
R59	1000Ω	
R60	270K	
R61	1000Ω	
R62	10K 5%	
R63	10K	
R64	100K 5% 1W	

ITEM No.	RATING	REMARKS
R65	100K 5% 1W	
R66	270K	
R67	1000Ω	
R68	250Ω 5W	
R69	270K	
R70	1000Ω	
R71	100Ω 15W	
R72	1200Ω 10W	
R73	47K 1W	
R74	220Ω 1W	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V @ .97A	640VCT @ .140A	24V @ .2A	80-33-0						
	SEC. 3	SEC. 4	SEC. 5							
	5V @ 3A	6.3V @ 3.1A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	6400Ω CT	6-8Ω	80-106-1	24S43	A-2905	AU-609 ①	A-3880	24S43	S-55X ①	① Drill new mounting hole.
T4	6400Ω CT	6-8Ω	80-106-1	24S43	A-2905	AU-609 ①	A-3880	24S43	S-55X ①	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	12"	PM	14-16Ω	33-423-4	12A6AZ16	
SP2	12"	PM	14-16Ω	33-423-4	12A6AZ16	
SP3	4"	PM	12-14Ω	33-417-4	4A07Z13.5	
SP4	4"	PM	12-14Ω	33-417-4	4A07Z13.5	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1144-0	AM Tuning
Knob	52-1109-0	FM Tuning
Knob	52-1267-0	Loudness, Bass, Treble
Knob	52-1273-0	Stereo Balance, Bass, Treble, Radio Selector
Knob	52-1275-0	Amplifier Selector
Knob	52-1237-0	Off-On, Reject (Changer)
Knob	52-1238-0	Speed Control (Changer)
Escutcheon	40-211-0	Radio
Escutcheon	40-132-0	Automatic Power Control
Cabinet	42-121-3	Model 69
Cabinet	42-122-3	Model 70
Cabinet	42-123-3	Model 71
Leg	49-502	Model 69
Leg	49-503	Model 70
Leg	49-504	Model 71

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 280, 281, 282 (Ch. 528.59410, 411, 420)

SILVERTONE MODELS 280, 281, 282 (Ch. 528.59410, 411, 420)

MODEL 280

SILVERTONE MODELS 280, 281, 282 (Ch. 528.59410, 411, 420)

TRADE NAME	Silvertone Models 280, 281, 282 (Preamp. Ch. 528.59420, Amp. Ch. 528.59410 or 528.59411)
SUPPLIER	Sears, Roebuck & Co., 925 Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 9 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 130 Watts, 1.28 Amp. @ 117 Volts AC (Less Phono)

FOR SERVICE INFORMATION ON RECORD CHANGER 528.56780 OR 528.56781 — SEE SILVERTONE 528.56310 PHOTOFACT SET 417 FOLDER 10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT635

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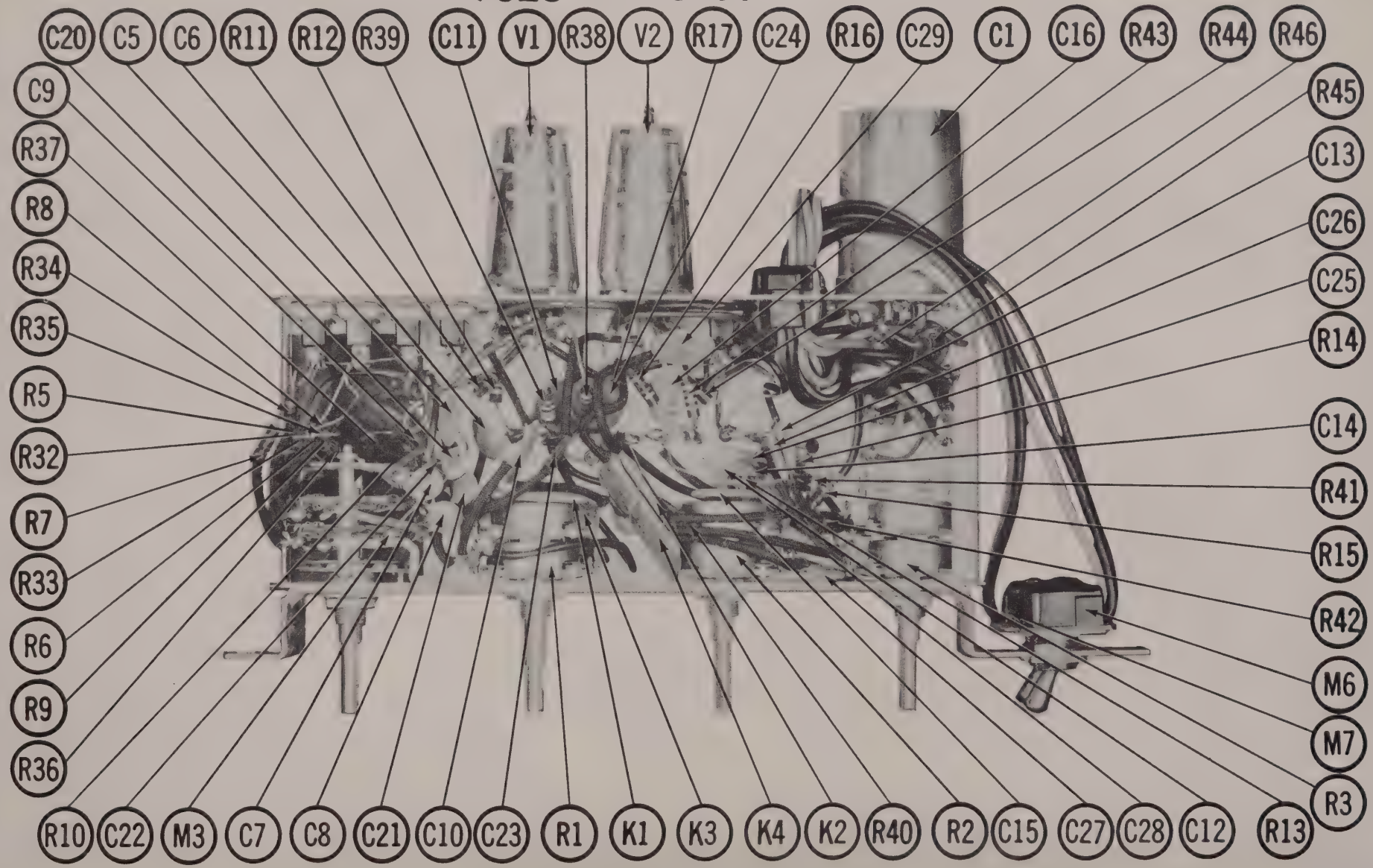
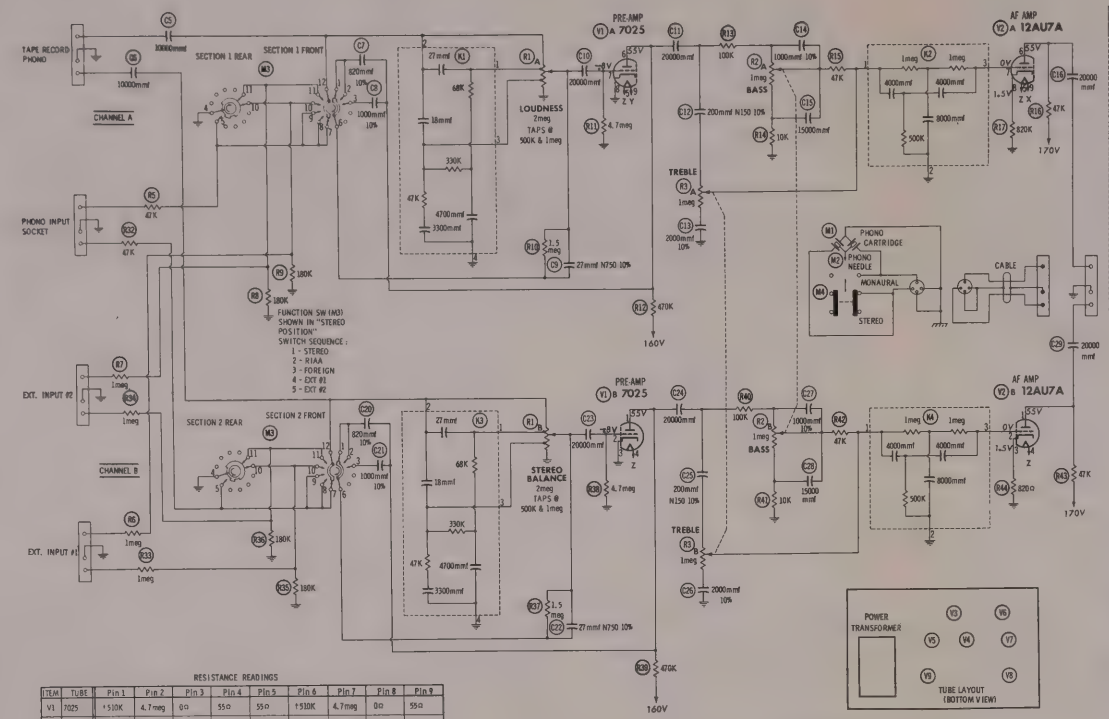
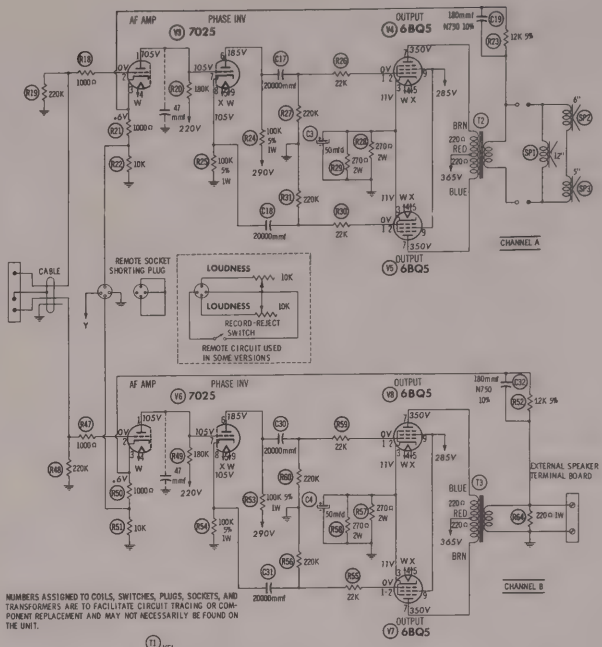
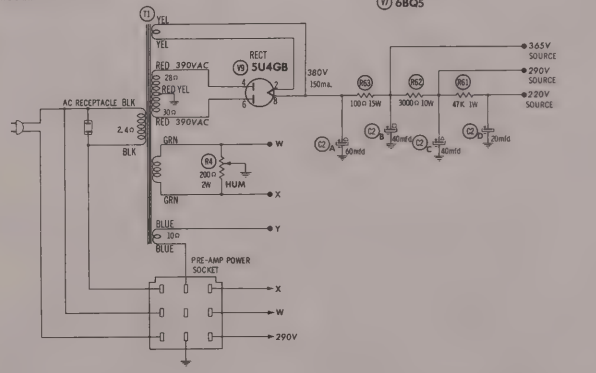


PREAMP CHASSIS - BOTTOM VIEW







RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	↑510K	4.7meg	0Ω	55Ω	55Ω	↑510K	4.7meg	0Ω	55Ω
V2	12AU7A	↑72K	2meg	820Ω	55Ω	55Ω	↑72K	2meg	820Ω	55Ω
V3	7025	↑230K	220K	1000Ω	55Ω	55Ω	↑100K	↑230K	100K	55Ω
V4	6BQ5	240K	240K	135Ω	55Ω	55Ω	NC	↑320Ω	NC	↑310Ω
V5	6BQ5	240K	240K	135Ω	55Ω	55Ω	NC	↑320Ω	NC	↑310Ω
V6	7025	↑230K	220K	1000Ω	55Ω	55Ω	↑100K	↑230K	100K	55Ω
V7	6BQ5	240K	240K	135Ω	55Ω	55Ω	NC	↑320Ω	NC	↑310Ω
V8	6BQ5	240K	240K	135Ω	55Ω	55Ω	NC	↑320Ω	NC	↑310Ω
V9	5U4GB	NC	¶	NC	28Ω	NC	30Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
‡ MEASURED FROM PIN 2 OF V9.
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SILVERTONE MODELS 280, 281, 282 (Ch. 528.59410, 411, 420)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A Preamp. Channel B Preamp.	7025	V5	Channel A Output	6BQ5
V2	Channel A AF Amp. - Channel B AF Amp.	12AU7A	V6	Channel B AF Amp. - Phase Inverter	7025
V3	Channel A AF Amp. - Phase Inverter	7025	V7	Channel B Output	6BQ5
V4	Channel A Output	6BQ5	V8	Channel B Output	6BQ5
			V9	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	350	18-58-3	AFH2-69	B0500	FP237	TMD-61	TVL-2935	
B	▲20	350							
C2A	▲60	450	18-55-3		C0365	FP375.6	TMT-193	TVL-3791	
B	■40	450			BR4035	TC795	TD-40-350	TVA-1611	
C	▲40	350							
D	20	300							
C3	50	25	18-23-0	PRS1340	BBR50-25	TC29	TD-50-25	TVA-1206	
C4	50	25	18-23-0	PRS1340	BBR50-25	TC29	TD-50-25	TVA-1206	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	820 10%		DI-820	DD-821	1R5T82	CCD-821	GP382	10TS-T82
C8	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C9	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S2
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S2
C12	200 N150 10%	#15-20111				*		
C13	2000 10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C14	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C15	15000		BPD-015	DD-153	BYB6S15	CCD-153	GP115	5HK-S15
C16	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C17	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C18	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C19	180 N750 10%			TCN-180	C10T18U		CN7-318	10TCU-T18
C20	820 10%		DI-820	DD-821	1R5T82	CCD-821	GP382	10TS-T82
C21	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C22	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C23	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C24	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C25	200 N150 10%	#15-20111				*		

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C26	2000 10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C27	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C28	15000		BPD-015	DD-153	BYB6S15	CCD-153	GP150	5HK-S15
C29	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C30	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C31	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C32	180 N750 10%			TCN-180	C10T18U		CN7-318	10TCU-T18
C33	.22 400V	Note 1	P488N-22		CUB4P22	4DP-4-224	GEM-4022	4TM-P22

Silvertone Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RES.-ST-ANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg *		24-358-0					Loudness, Channel A
B	2meg *							Stereo Balance, Channel B
R2A	1meg		24-201-2	AB-70	AD47-1meg-Z	Q13-137		Bass, Channel A
B	1meg			SR-70	Not Req.	M13-137		Bass, Channel B
C	Shaft			AK-8	RS-3/16	NQ		
R3A	1meg		24-200-2	AB-70	AD47-1meg-Z	Q13-137		Treble, Channel A
B	1meg			SR-70	Not Req.	M13-137		Treble, Channel B
C	Shaft			AK-8	RS-3/16	NQ		
R4	200Ω	2(WW)	24-1-3				FL200P	Hum Control

* Taps @ 500K & 1meg.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	47K	
R6	1meg	
R7	1meg	
R8	180K	
R9	180K	
R10	1.5meg	
R11	4.7meg	
R12	470K	
R13	100K	
R14	10K	
R15	47K	
R16	47K	
R17	820K	
R18	1000Ω	
R19	220K	
R20	180K	
R21	1000Ω	
R22	10K	
R23	12K 5%	
R24	100K 5% 1W	

ITEM No.	RATING	REMARKS
R25	100K 5% 1W	
R26	22K	
R27	220K	
R28	270Ω 2W	
R29	270Ω 2W	
R30	22K	
R31	220K	
R32	47K	
R33	1meg	
R34	1meg	
R35	180K	
R36	180K	
R37	1.5meg	
R38	4.7meg	
R39	470K	
R40	100K	
R41	10K	
R42	47K	
R43	47K	
R44	820Ω	

ITEM No.	RATING	REMARKS
R45	22K	
R46	22K 1W	
R47	1000Ω	
R48	220K	
R49	180K	
R50	1000Ω	
R51	10K	
R52	12K 5%	
R53	100K 5% 1W	
R54	100K 5% 1W	
R55	22K	
R56	220K	
R57	270Ω 2W	
R58	270Ω 2W	
R59	22K	
R60	220K	
R61	47K 1W	
R62	3000Ω 10W	
R63	100Ω 15W	
R64	220Ω 1W	

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Ch. A Loudness Comp.	18mmf, 27mmf, 3300mmf, 4700mmf, 47K, 330K, 68K	13-19-3	
K2	Ch. A Rumble Filter	4000mmf, 4000mmf, 8000mmf, 500K, 1meg, 1meg	13-37-3	
K3	Ch. B Loudness Comp.	18mmf, 27mmf, 3300mmf, 4700mmf, 47K, 330K, 68K	13-19-3	
K4	Ch. B Rumble Filter	4000mmf, 4000mmf, 8000mmf, 500K, 1meg, 1meg	13-37-3	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	83-1308	W-103STSS † or W-103STDS ♦†	S-69X † or S-69XSD †♦ or S-69XDD ♦	† Jewel ♦ Diamond

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.28A	780 VCT @ .150A	5V @ 3A	80-35-0						
	SEC. 3	SEC. 4	SEC. 5							
	24V @ 2A	6.3V @ 4.3A								

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Switch	69-297-0	Function (Rotary Type)
M4	Switch	69-282-0	Stereo-Monaural (DPDT Slide Type) Part of Changer
M5	Switch	84-7838	Record Changer Off-On (Part of Changer)
M6	Switch	69-295-0	Off-On (Toggle)
M7	Switch	69-296-0	Automatic Power Control (Toggle)
M8	Motor	59-89	Turntable Drive (Complete) Chassis 528.56781
	Motor	59-72	Turntable Drive (Complete) Chassis 528.56780
M9	Solenoid	27-74-2	Reject

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6400Ω CT	6-8Ω	80-106-1	24S43	A-2905	AU-609①	A-3880	24S43	S-55X①	① Drill New Mounting Hole
T3	6400Ω CT	6-8Ω	80-106-1	24S43	A-2905	AU-609①	A-3880	24S43	S-55X①	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1274-0	Function Selector, Treble, & Bass
Knob	52-1241-0	Stereo Balance
Knob	52-1267-0	Loudness
Knob	52-1237-0	Off-On Reject (Part of Changer)
Knob	52-1238-0	Speed Control (Part of Changer)
Cabinet	42-106-2	Model 280
Cabinet	42-107-2	Model 281
Cabinet	42-108-2	Model 282
Cabinet	42-38-4	Amplifier & Speaker Enclosure, Model 280
Cabinet	42-39-4	Amplifier & Speaker Enclosure, Model 281
Cabinet	42-40-4	Amplifier & Speaker Enclosure, Model 282

SPEAKER

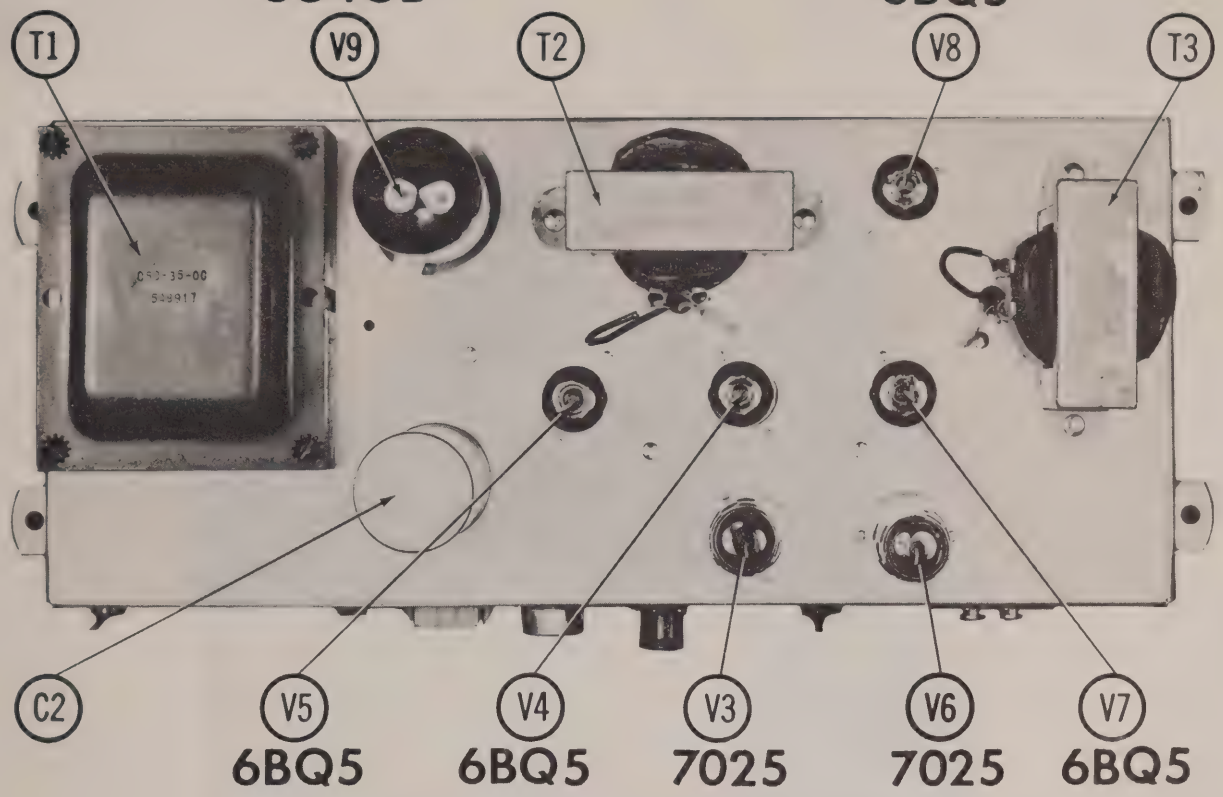
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	33-419-4	12A1Z7.4	
SP2	6"	PM	6-8Ω	33-425-4	6A1Z7.1	
SP3	5"	PM	6-8Ω	33-430-4	5A1Z7.9	

PHONO CARTRIDGE

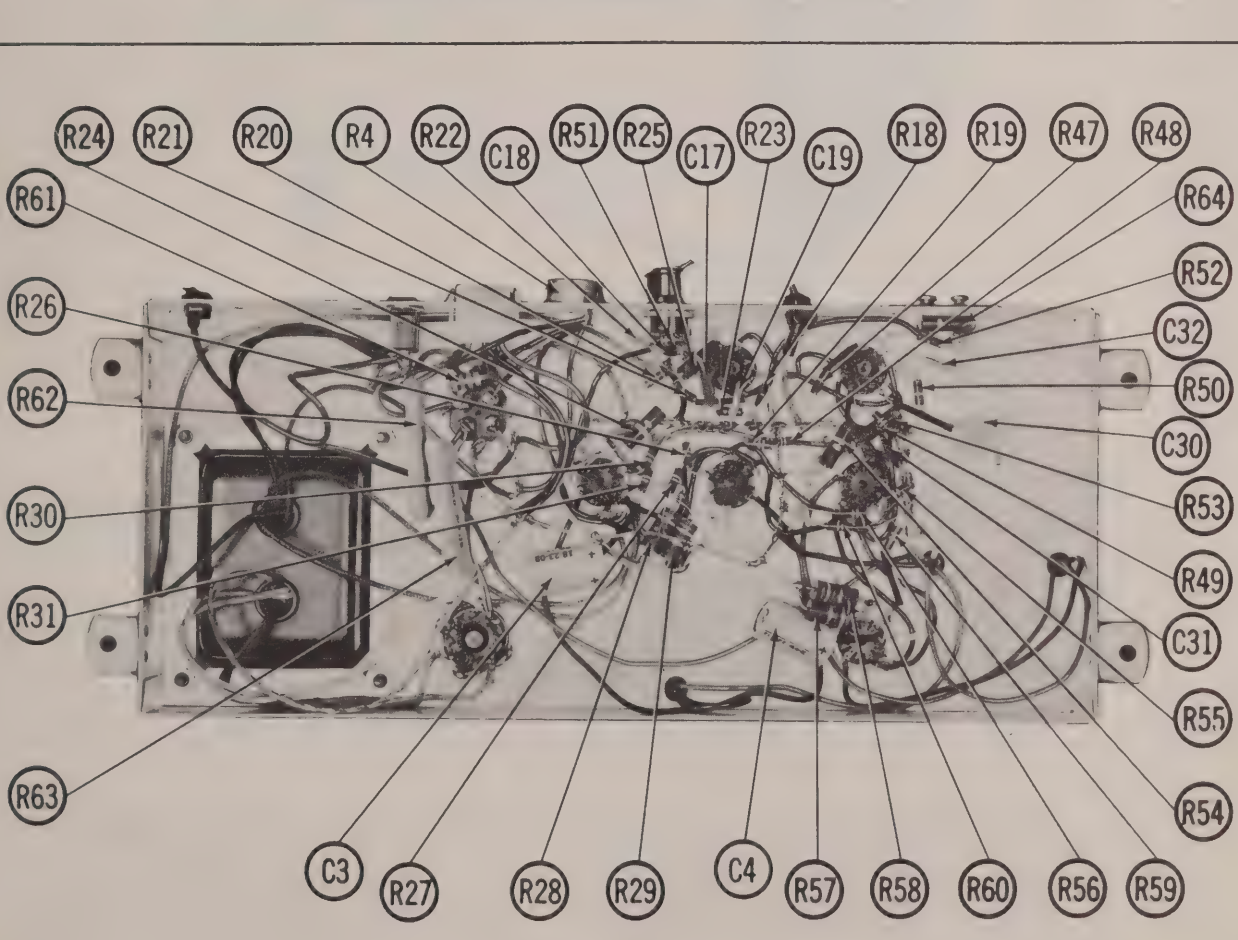
ITEM No.	REPLACEMENT DATA							
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	33-314-0	13TB	Not Req.	26	Not Req.			8TA4-S	N-8TA-S

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



AMPLIFIER CHASSIS - TOP VIEW



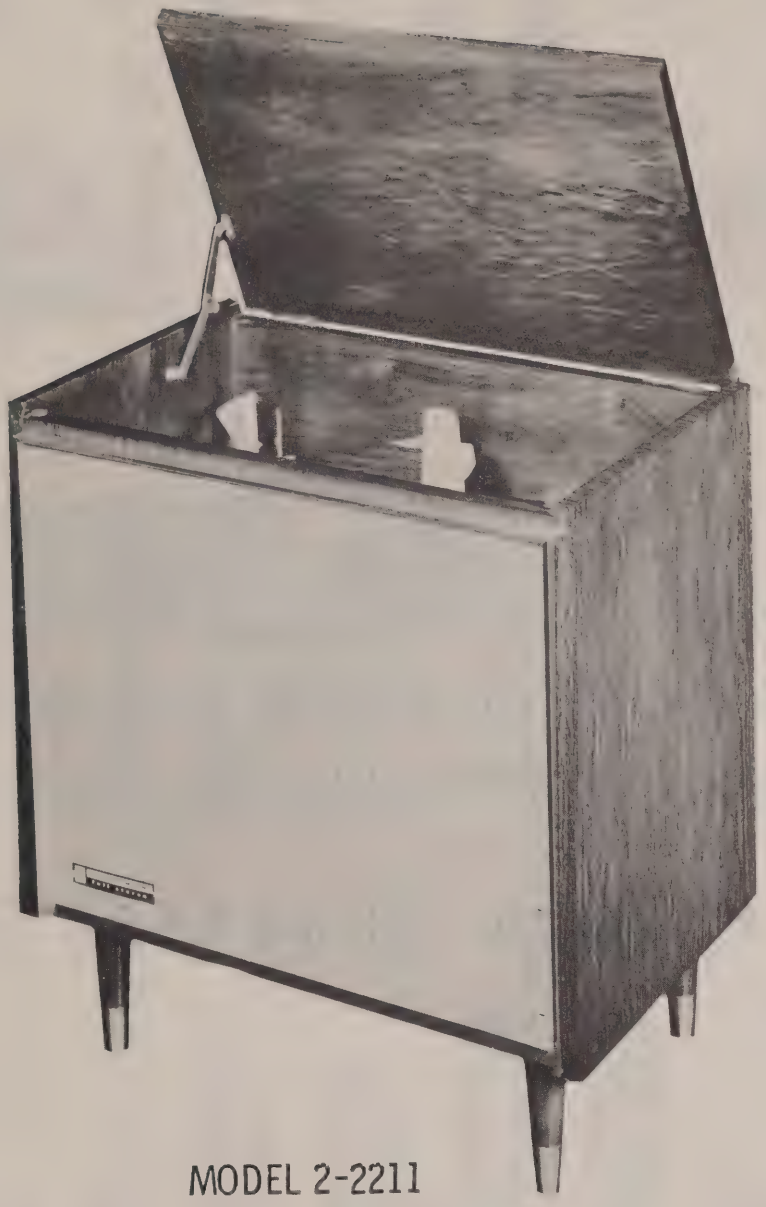
AMPLIFIER CHASSIS - BOTTOM VIEW

PHOTOFACT® Folder

EIA

STEELMAN MODELS 2-2211, -1, 2-2221, -1, 2-6211, -1, 2-6221, -1

STEELMAN MODELS 2-2211, -1, 2-2221, -1, 2-6211, -1, 2-6221, -1



MODEL 2-2211

STEELMAN MODELS 2-2211, -1, 2-2221, -1, 2-6211, -1, 2-6221, -1

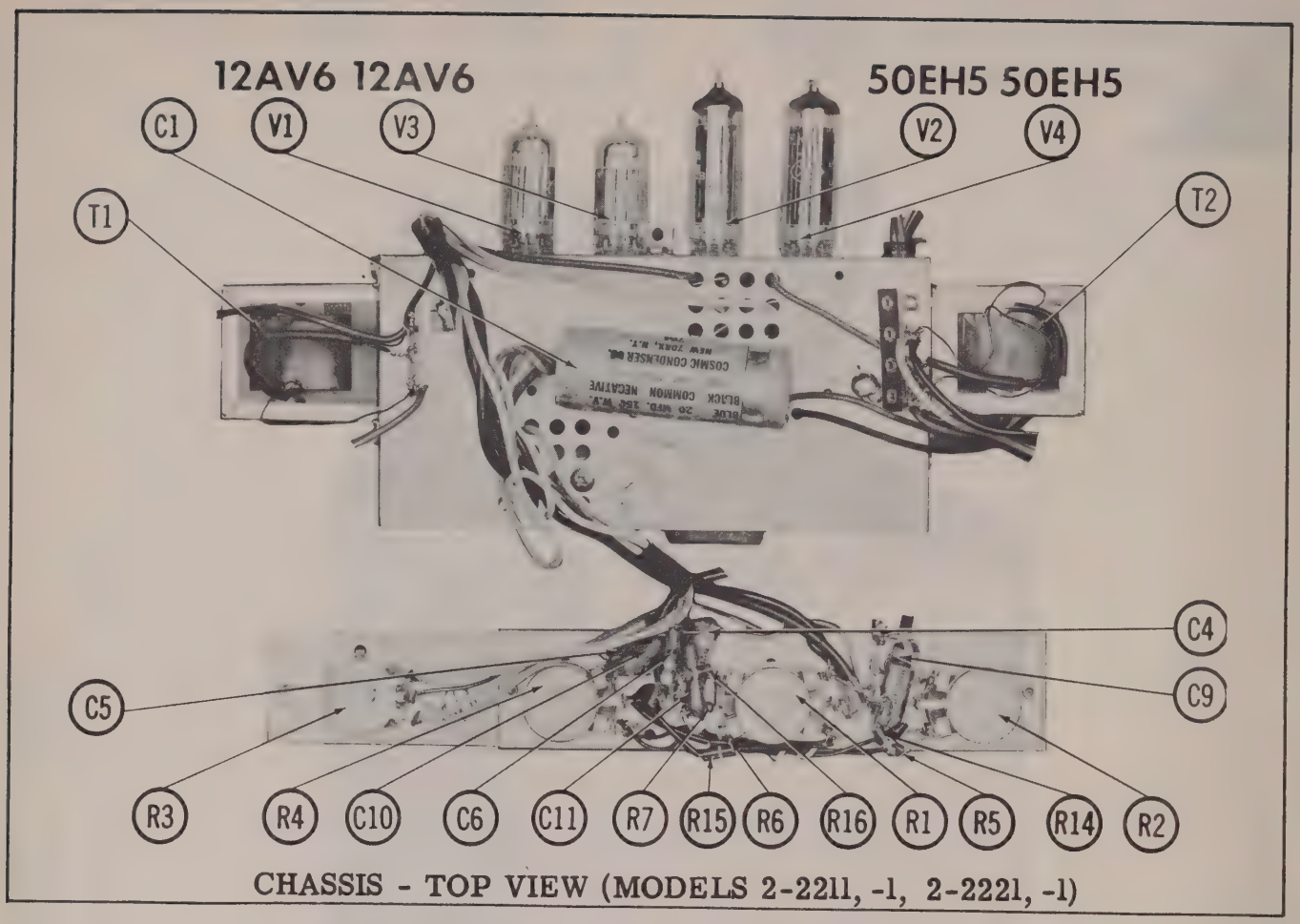
TRADE NAME	Steelman Models 2-2211, 2-2211-1, 2-2221, 2-2221-1, 2-6211, 2-6211-1, 2-6221, 2-6221-1
MANUFACTURER	Steelman Phono & Radio Co., 2-30 Anderson Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 29 Watts, .31 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #300046 USED IN MODELS 2-2211, 2-2211-1, 2-2221, 2-2221-1, 2-6221, 2-6221-1 - SEE V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

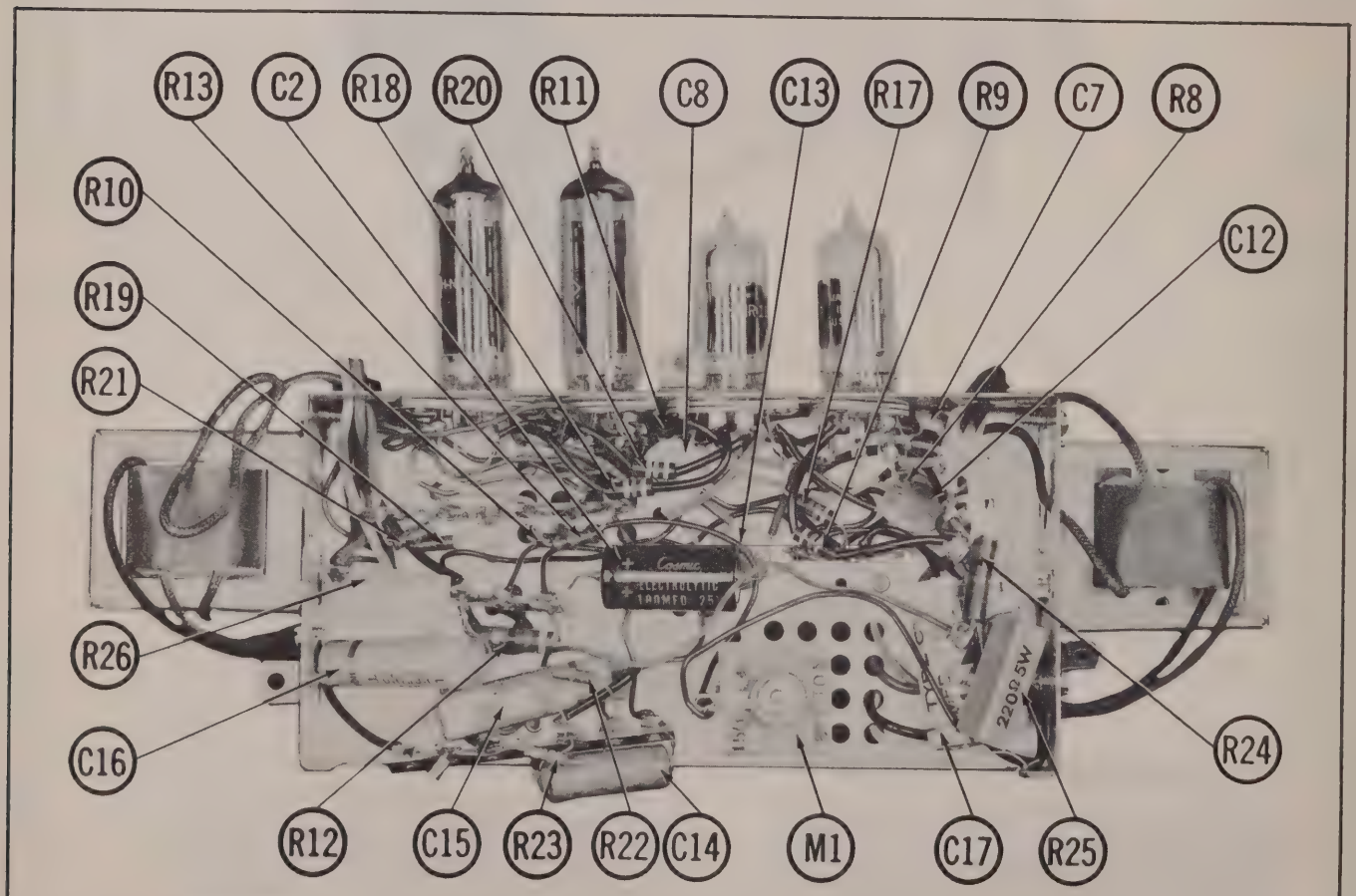
FOR SERVICE INFORMATION ON RECORD CHANGER PART #300413 USED IN MODELS 2-6211, 2-6211-1 - SEE MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

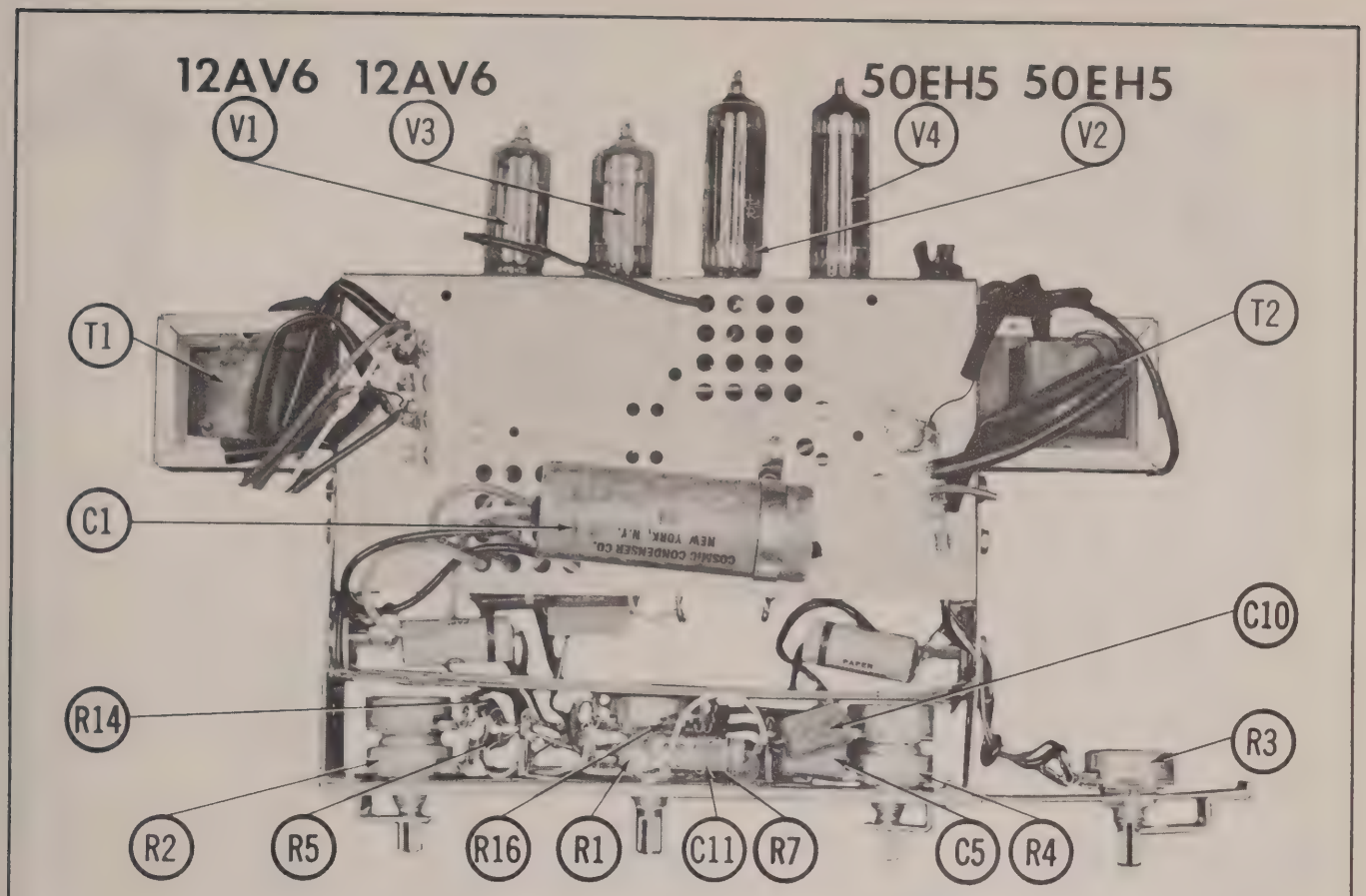
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



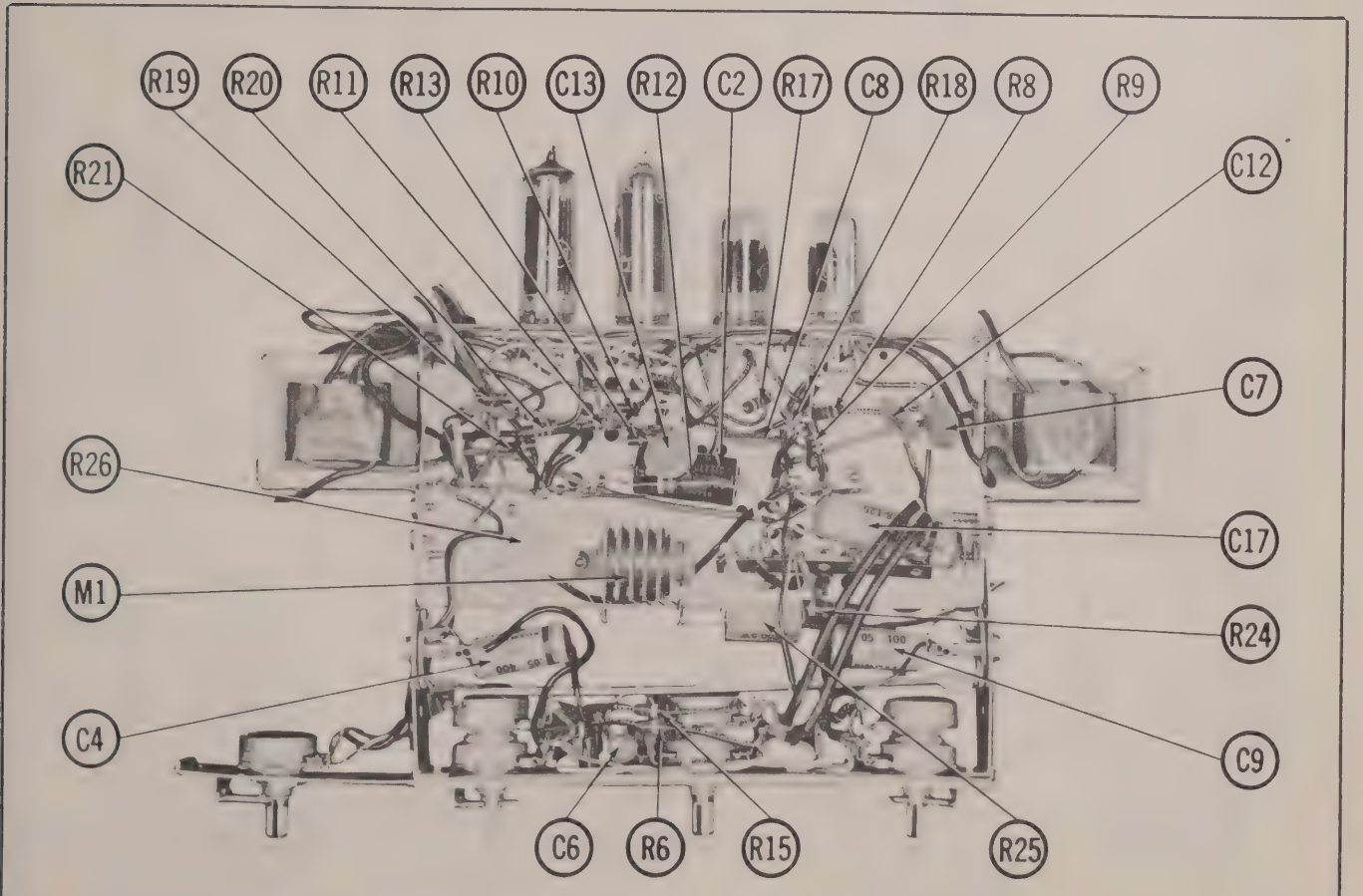
CHASSIS - TOP VIEW (MODELS 2-2211, -1, 2-2221, -1)



CHASSIS - BOTTOM VIEW (MODELS 2-2211, -1, 2-2221, -1)



CHASSIS - TOP VIEW (MODELS 2-6211, -1, 2-6221, -1)



CHASSIS - BOTTOM VIEW (MODELS 2-6211, -1, 2-6221, -1)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆		GENERAL ELECTRIC ◆		RAYTHEON ◆		SYLVANIA ◆	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amplifier	12AV6	V3	Right Channel AF Amplifier	12AV6
V2	Left Channel Output	50EH5 ①	V4	Right Channel Output	50EH5 ①

① Some versions may use 50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	583021	PR4-250	BBRQ0926.5	WQ410	TDLD-13	TVA-4708	
B	80	150					TD-20-150		
C	20	150							
C2	100	25	581027	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	
C3	2	50VNP	581047 ♦	NP-PRS7400	BBR4-50 †	TCN502		TVAS-1301.1 *	Note 1

♦ Alternate Part #581018.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

Note 1. Models 2-6211, 2-6211-1 use 4mfd.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.05 200V	(.047mfd) *	P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C5	680		1468-00068	D6-681	1R5T68	CM-20V-681M	MCJ249	MS-368
C6	3000	(.0027mfd) *	SI 3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.05 200V	(.047mfd) *	P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C10	680		1468-00068	D6-681	1R5T68	CM-20B-681M	MCJ249	MS-368
C11	3000	(.0027mfd) *	SI 3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	.0015 200V	(.002mmf) *	P288N-0015	D6-215	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C15	.047 400V	(.05mfd) *	P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C16	.047 400V	(.05mfd) *	P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	.1 400V	(.05mfd) *	P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

* Alternate Value

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3.25meg*	1/2	368037				■ UE3956	Volume, Left Channel
B	3.25meg*	1/2						Volume, Right Channel
R2A	5meg	1/2	368036	B-88	AD47-5meg-S			Bass, Left Channel
B	5meg	1/2		SR-88	Not Req.		▲ UE3967	Bass, Right Channel
C	Shaft			Not Req.	KSS-3			
R3	100Ω	1/2	368025	B-1			U1	Balance
R4A	250K	1/2	368035	B-50	AD47-250K-S	Q11-130		Treble, Left Channel
B	250K	1/2		SR-50	Not Req.	M11-130	▲ UE4062	Treble, Right Channel
C	Shaft			Not Req.	KSS-3	KSS-3		

* Taps @ 1meg and 2meg. Taps #2 not used.
■ "STA-LOC" Equivalent: FA36T95, RU36T16, CS3500.
▲ "STA-LOC" Equivalent: FA56A, RU56A, CS3500.
▲ "STA-LOC" Equivalent: FA254L, RU254L, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	100K	
R6	220K	
R7	100K	
R8	4.7meg	
R9	470K	
R10	15Ω	
R11	470K	
R12	36Ω 1W	Note 1

ITEM No.	RATING	REMARKS
R13	1000Ω	
R14	100K	
R15	220K	
R16	100K	
R17	4.7meg	
R18	470K	
R19	15Ω	
R20	470K	

ITEM No.	RATING	REMARKS
R21	1000Ω	
R22	22K	Note 2
R23	3.3meg	Note 2
R24	1000Ω 1W	
R25	220Ω 5W	
R26	50Ω 5W	

Note 1. Some versions may use 82Ω or 33Ω or 47Ω in this application.
Note 2. Used in Models 2-2211, 2-2211-1 only.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2600Ω	60Ω SEC. 2 3-4Ω CT	430563							
T2	2600Ω	SEC. 1 60Ω SEC. 2 3-4Ω CT	430563							

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	324513	80TS	Not Req.	66 †	Not Req.			8TA4-S	N-8TA-S

† Use Mount PT-3.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA STEELMAN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	8"	PM	4-5Ω	408001	7A31	
SP2	4"	PM	4-5Ω	404009	4A1TZ4. 7	
SP3	6"	PM	3-4Ω	406002	6A31	
SP4	6"	PM	3-4Ω	406002	6A31	
SP5	Electrostatic			409001		
SP6	Electrostatic			409001		

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

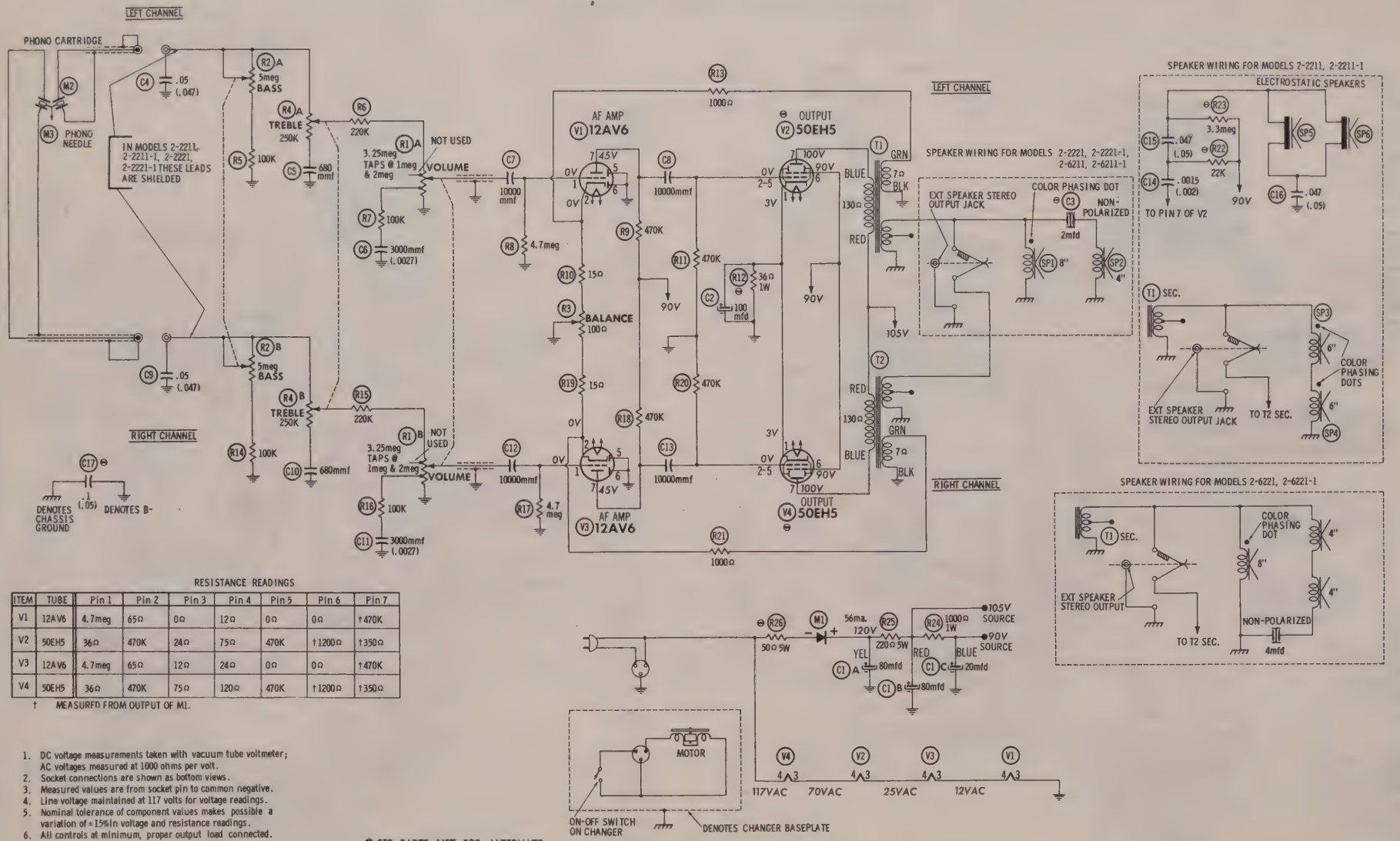
ITEM No.	REPLACEMENT DATA STEELMAN PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	(78RPM)	W-104S † or W-104STS † or W-104STD ♦	CRA-57 † or CRA-57D ♦	† Jewel ♦ Diamond
	(LP)	W-104MGS † or W-104MGD ♦	CRA-57X † or CRA-57XD ♦	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA STEELMAN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.056A	38001l ①	RS150 ①	1235AH ①	150 ①	SR200 ②	① Selenium Type ② Silicon Type

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AV6	4.7meg	65Ω	0Ω	12Ω	0Ω	0Ω	†470K
V2	50EH5	36Ω	470K	24Ω	75Ω	470K	†1200Ω	†350Ω
V3	12AV6	4.7meg	65Ω	12Ω	24Ω	0Ω	0Ω	†470K
V4	50EH5	36Ω	470K	75Ω	120Ω	470K	†1200Ω	†350Ω

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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STEELMAN MODELS 2-2211, -1, 2-2221, -1, 2-6211, -1, 2-6221, -1

PHOTOFACT® Folder

SYLVANIA MODELS SC05, SC08, 4315, 4318, 4321 (Ch. 1-633-1)

SYLVANIA MODELS SC05, SC08, 4315, 4318, 4321 (Ch. 1-633-1)

MODEL 4321M

SYLVANIA MODELS SC05, SC08, 4315, 4318, 4321 (Ch. 1-633-1)

TRADE NAME	Sylvania Models SC05, SC08, 4315, 4318, 4321 (Ch. 1-633-1)		
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc. 700 Ellicott St., Batavia, N. Y.		
TYPE SET	AC Operated 4 Tube Phono Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	55 Watts, .56 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT453

SET 474 FOLDER 16

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amp. - Phase Inverter	7199	V3	Output	6V6GT
V2	Output	6V6GT	V4	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	450	161-4027	AFH4-92-50	D0624	FP433.4	TMQ-90	TVL-4771.6	
B	■40	450							
C	▲20	450							
D	10	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C3	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C4	.047 600V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C5	.001 600V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D1
C6	.047 600V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C7	.001 600V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-611	6TM-D1
C8	2mfd 50V		P1589ZXY-2		MP2W2			118P20502S2

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5meg	½	153-0185 ①	B-87	AD47-5meg-S	Q11-141		Master Volume, Channel 2
B	5meg	½	①	SR-87	Not Req.	M11-141	■ UE4050	Master Volume, Channel 1
C	Shaft			Not Req.	KSS-3	Not Req.		
R2A	1meg	½	153-0184 ②	B-70	A47-1meg-Z	Q13-137	U53	Bass, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	½	153-0184 ③	B-70	A47-1meg-Z	Q13-137	U53	Treble, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4	2.2meg	½	153-0189 ④	BT-175		Q13-139XX	UDT-296	Loudness, Channel 1

① Used in Model 4321 only.
② Models 4315, 4318, SC05 use 1meg Bass (Part #153-0176).
③ Models 4315, 4318, SC05 use 1meg Treble (Part #153-0183).
④ Models 4315, 4318 use 2.2meg Loudness (Part #153-0175).
Model SC05 uses 2.2meg Loudness with switch (Part #152-0059).
Model SC08 uses 2.2meg Loudness with switch (Part #152-0060).

■ "STA-LOC" Equivalent: FA56L, RU56L, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

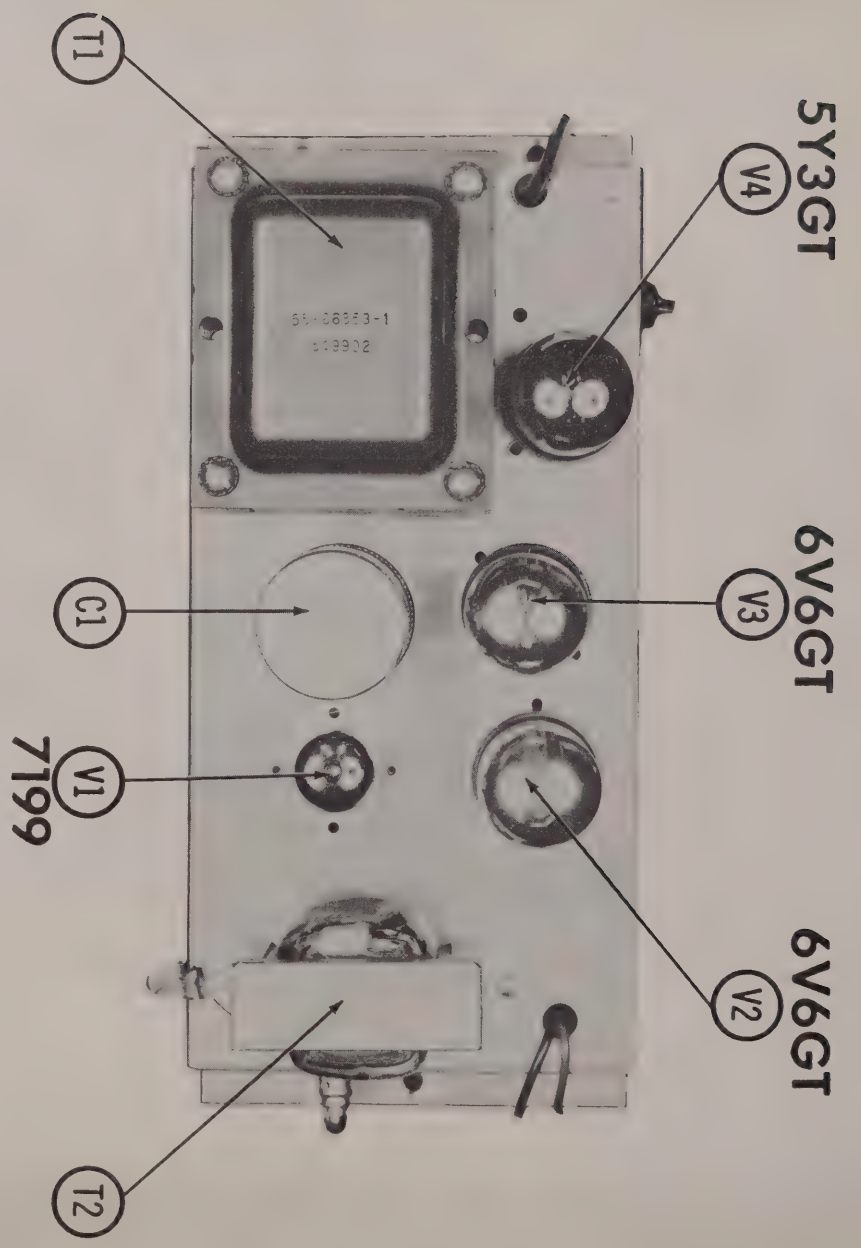
ITEM No.	RATING	REMARKS
R5	6.8meg	
R6	220K	
R7	1meg	
R8	82Ω	
R9	47K	

ITEM No.	RATING	REMARKS
R10	100K	
R11	1500Ω	
R12	470K	
R13	470K	
R14	200Ω 5W	

ITEM No.	RATING	REMARKS
R15	68K	
R16	1500Ω 1W	
R17	100Ω 2W	
R18	1meg	Note 1

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
				SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1	SEC. 2							
T1	117V @ .56A	580VCT @ .072A	5V @ 2A	141-0068	22R04	P3052		PM8405	22R04	R-12B
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.2A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9100Ω CT	3-4Ω	143-0048	26S59	A-3027	AU-609	A3870	26S59	S-55X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	15"	PM	6-8Ω	539-1502 ①	15A10L	① Models 4321, SC08
SP2	10"	PM	6-8Ω	539-1010 ①	10A31PA	② Models 4321, SC08, SC05, 4318, & 4315
SP3	4"	PM	12-14Ω	539-0407 ②	4AIT	③ Models 4315, 4318, & SC05
SP4	4"	PM	12-14Ω	539-0407 ②	4AIT	
	12"	PM		539-1208 ③		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Tone Compensator	18mmf, 27mmf, 820mmf, 3300mmf, 4700mmf, 47K, 68K, 330K	190-0030	Stock #32-87553-1

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

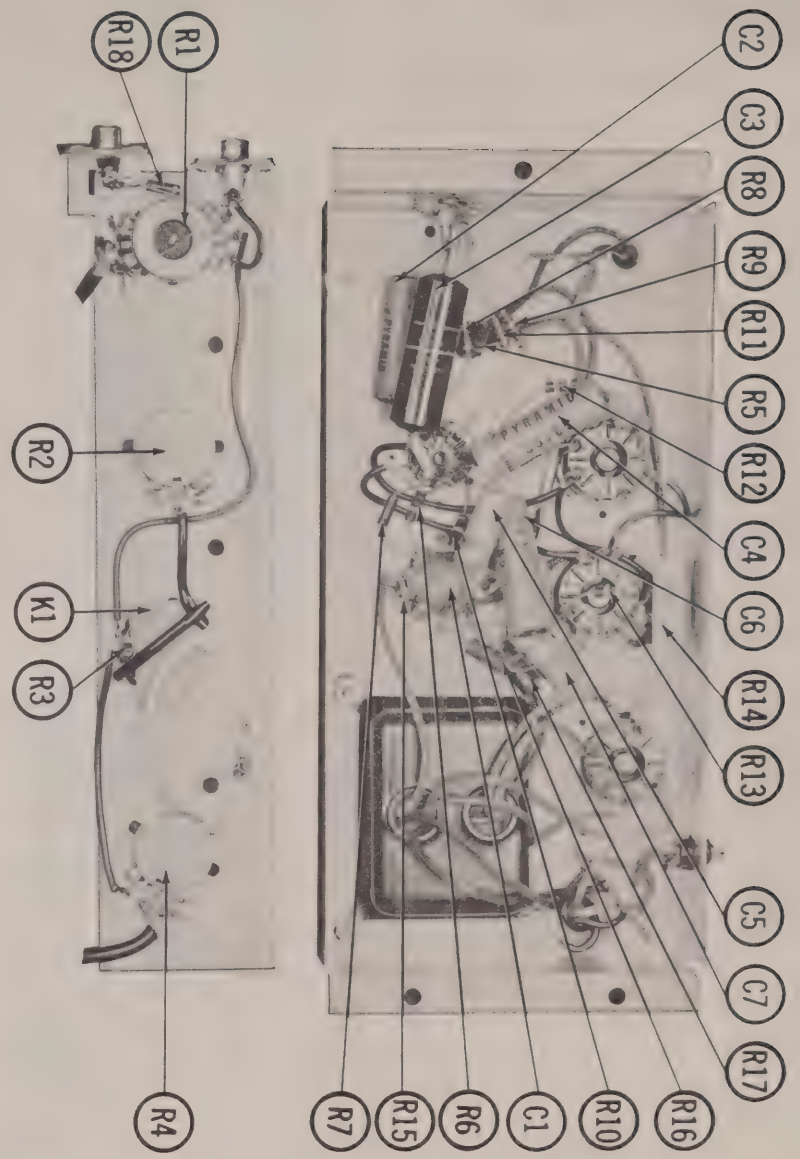
NAME	PART NO.	DESCRIPTION
Bezel	714-0129	Model 4315
Knob	740-0259	Loudness, Bass, Treble, Models 4321, SC08
Knob	740-0235	Loudness, Bass, Treble, Models 4315, 4318, & SC05

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

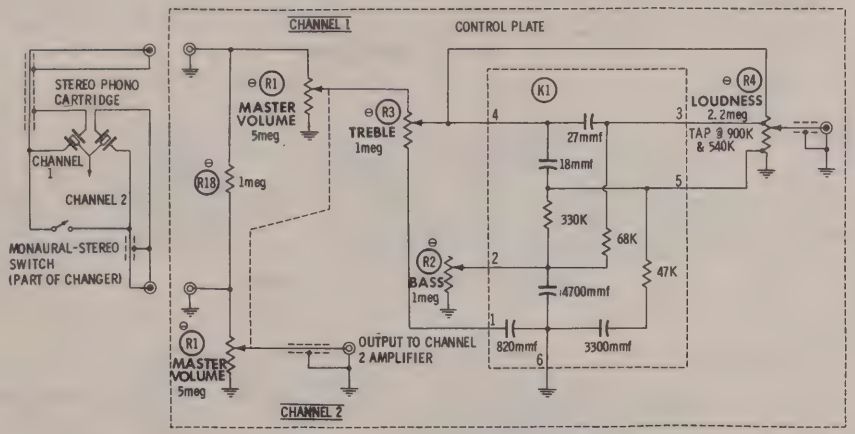
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

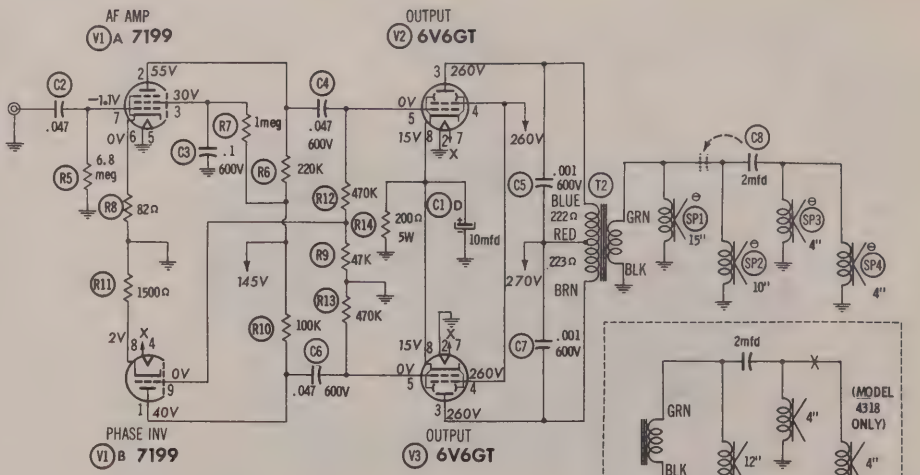
CHASSIS—BOTTOM VIEW

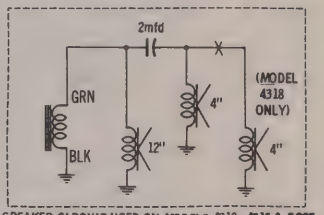


SYLVANIA MODELS SC05, SC08, 4315, 4318, 4321 (Ch. 1-633-1)

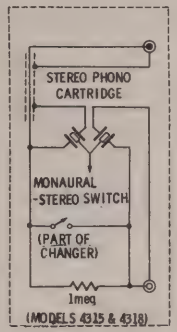
FOLDER 16

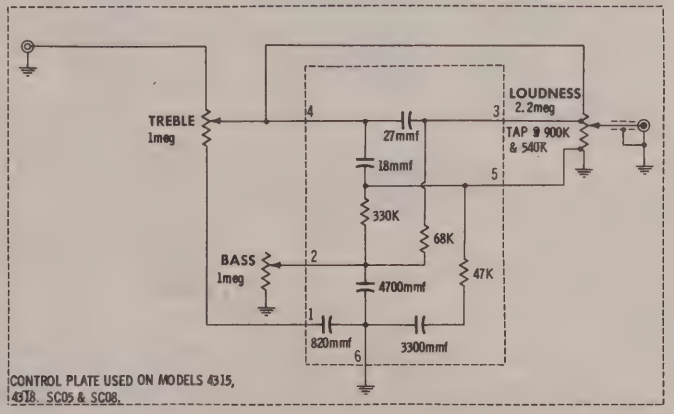




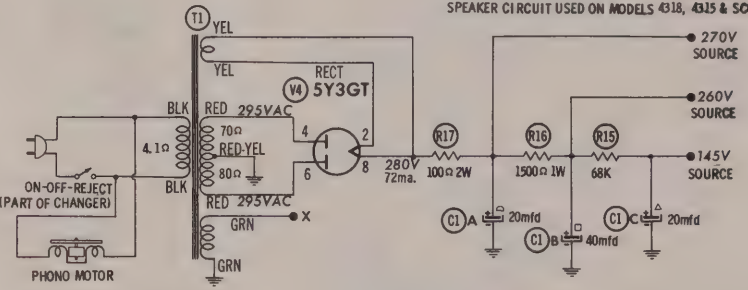


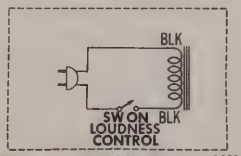
SPEAKER CIRCUIT USED ON MODELS 4318, 4315 & SC05.





CONTROL PLATE USED ON MODELS 4315, 4318, SC05 & SC08.





PRIMARY WINDING ON MODELS SC05 & SC08

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7199	†170K	†290K	†1meg	.1Ω	0Ω	82Ω	6.8meg	1500Ω	47K
V2	6V6GT	NC	0Ω	†320Ω	†1600Ω	520K	NC	.1Ω	180Ω	
V3	6V6GT	NC	0Ω	†320Ω	†1600Ω	470K	NC	.1Ω	180Ω	
V4	5Y3GT	NC	¶	NC	70Ω	NC	80Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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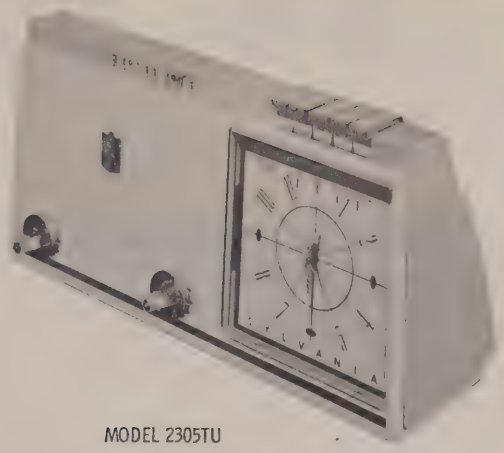
SYLVANIA MODELS SC05, SC08, 4315, 4318, 4321 (Ch. 1-633-1)

PHOTOFACT® Folder with CIRCUITRACE®

SYLVANIA MODELS 1304RE, TU, YE, 2305RE, TU, YE (Ch. 1-632-1, -2)

SYLVANIA MODELS 1304RE, TU, YE, 2305RE, TU, YE (Ch. 1-632-1, -2)



MODEL 2305TU

TRADE NAME	Sylvania Models 1304RE, 1304TU, 1304YE, 2305RE, 2305TU, 2305YE
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products Inc., 700 Ellicott St., Batavia, N. Y.
TYPE SET	AC Operated 6 Tube AM Receiver (2305 Series Has Electric Clock)
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	45 Watts, .44 Amp. @117 Volts AC (With Clock)
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS

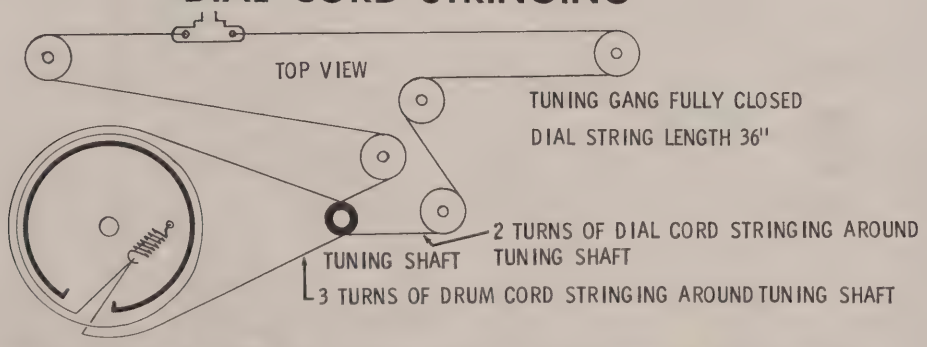
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5 thru A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A8, A9..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6, A7	Adjust for maximum output while rocking tuning gang.
4.		"	600KC	Tune to 600KC signal.	"	A8, A9	"

DIAL CORD STRINGING


TOP VIEW
TUNING GANG FULLY CLOSED
DIAL STRING LENGTH 36"
2 TURNS OF DIAL CORD STRINGING AROUND TUNING SHAFT
TUNING SHAFT
3 TURNS OF DRUM CORD STRINGING AROUND TUNING SHAFT

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JG452

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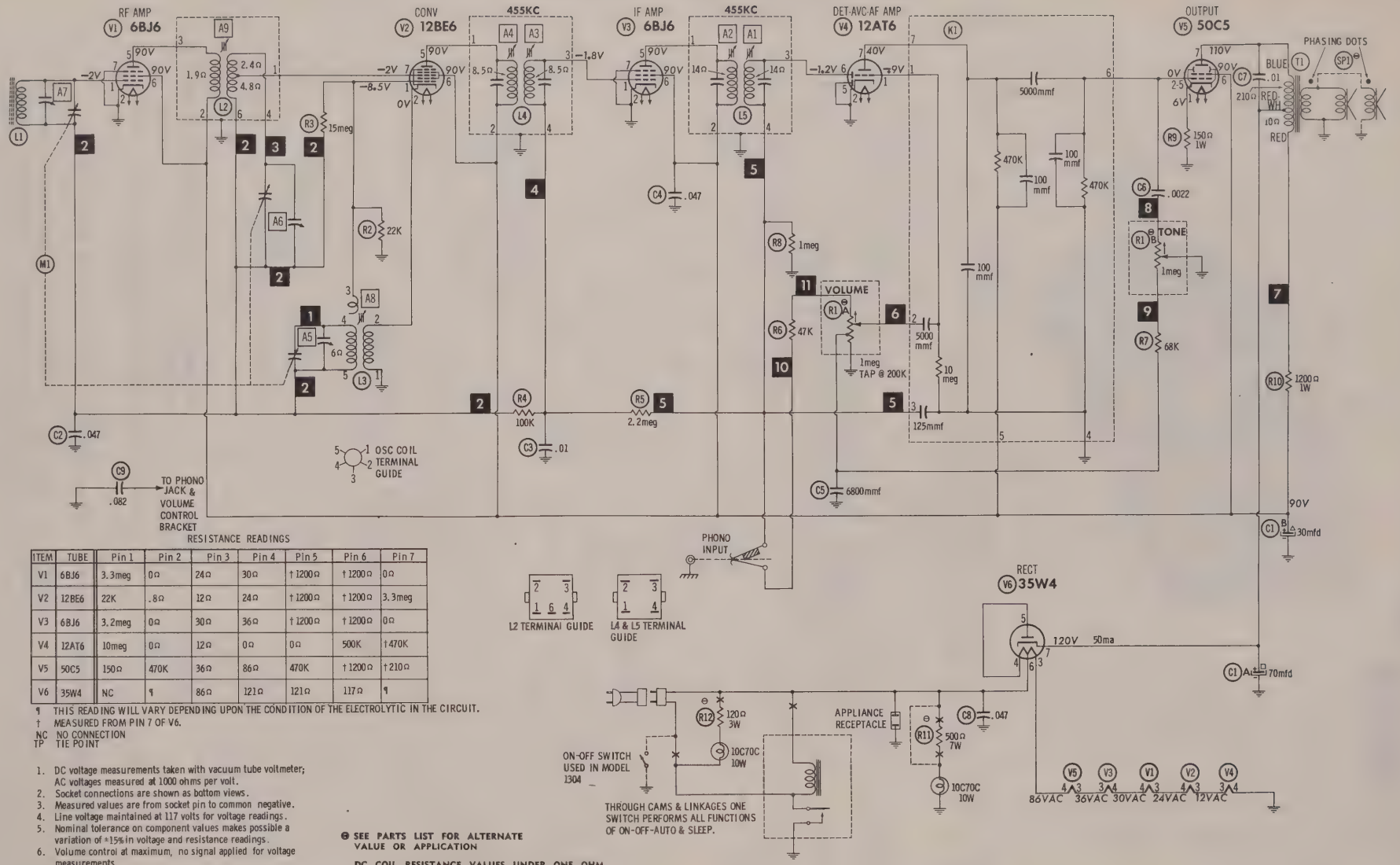

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BJ6	3.3meg	0Ω	24Ω	30Ω	†1200Ω	†1200Ω	0Ω
V2	12BE6	22K	.8Ω	12Ω	24Ω	†1200Ω	†1200Ω	3.3meg
V3	6BJ6	3.2meg	0Ω	30Ω	36Ω	†1200Ω	†1200Ω	0Ω
V4	12AT6	10meg	0Ω	12Ω	0Ω	0Ω	500K	†470K
V5	50C5	150Ω	470K	36Ω	86Ω	470K	†1200Ω	†210Ω
V6	35W4	NC	¶	86Ω	121Ω	121Ω	117Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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SYLVANIA MODELS 1304RE, TU, YE, 2305RE, TU, YE (Ch. 1-632-1, -2)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amplifier	6BJ6
V2	Converter	12BE6
V3	IF Amplifier	6BJ6
V4	Det. -AVC-AF Amp.	12AT6
V5	Output	50C5
V6	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■70	150	161-2016	PWH2-17-50	B0180 ‡	PFP214.3		PCL-2441	
B	▲30	150							

‡ Use printed circuit adaptor #55277 and 55278.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C3	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	6800		BPD-0068	DD-682	BYA10D68	CCD-682	GP268	5HK-D68
C6	.0022 400V		P488N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C7	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C8	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	.082 400V					6DP-4-823		5BF-S82

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	152-0057①					Volume
	200K tap							Tone
B	1meg	½						

① Model 1304 Series use Part #152-0055 (with switch).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	22K	
R3	15meg	
R4	100K	
R5	2.2meg	

ITEM No.	RATING	REMARKS
R6	47K	
R7	68K	
R8	1meg	
R9	150Ω 1W	

ITEM No.	RATING	REMARKS
R10	1200Ω 1W	
R11	500Ω 7W	#189-0065 Note 1
R12	120Ω 3W	#189-0064 Note 1

Note 1. Used in Model 2350 only.
Sylvania Part Number.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Audio Coupling	(3) 100mmf, 125mmf, (2) 5000mmf, (2) 470K, 10meg	190-0028	

PRINTED BOARD

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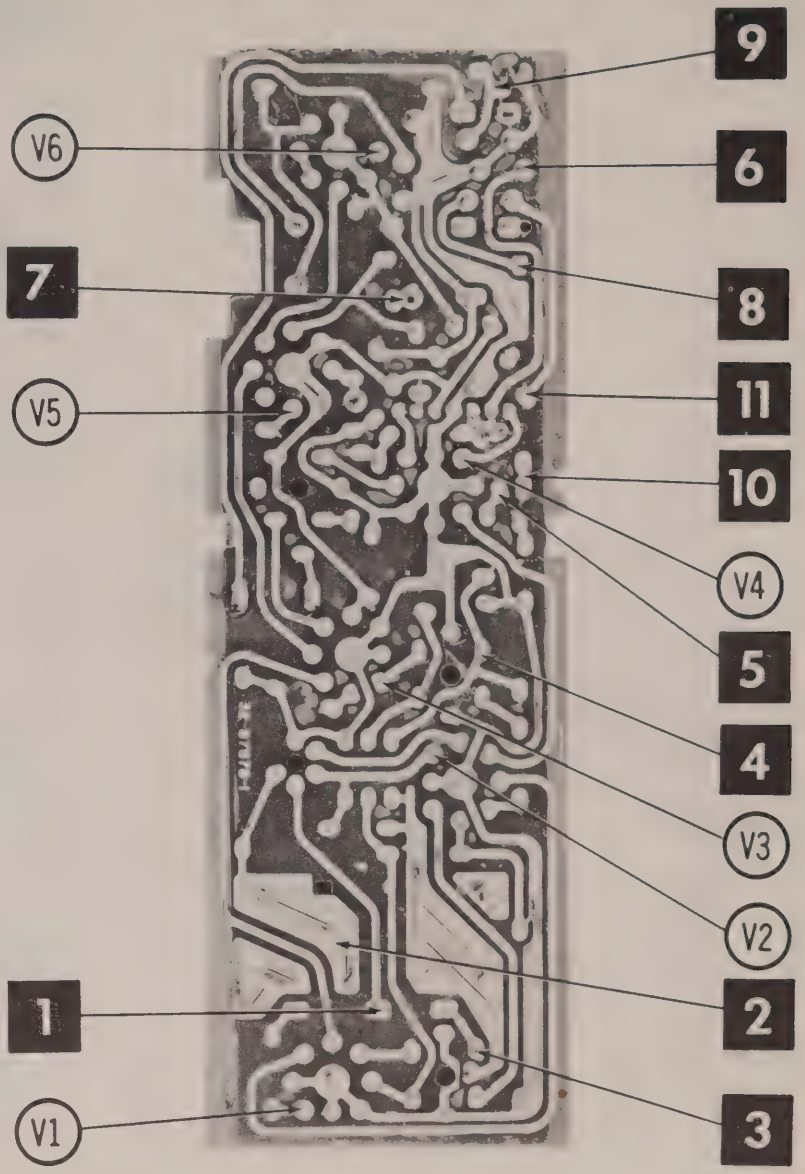
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SYLVANIA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	581-0016						
L2	RF Trans.	112-0017						
L3	Osc. Coil	113-0046						
L4	Input IF	121-0110	16-6780	16-6780	BC-356	13-PC1	RF-4	
L5	Output IF	121-0108	16-6780	16-6780	BC-357	13-PC2	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3000Ω Tap@ 6%	3-4Ω	143-0075	24S89	A-3031		A-3336	24S89	S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	539-0510①*	5A1R	① Models 2305RE, TU, YE
	5 1/4"	PM		539-0578②*		② Models 1304RE, TU, YE
	5 1/4"	PM		539-0579②		* Includes T1

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M1	Tuning Cap.	170-0031	3 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

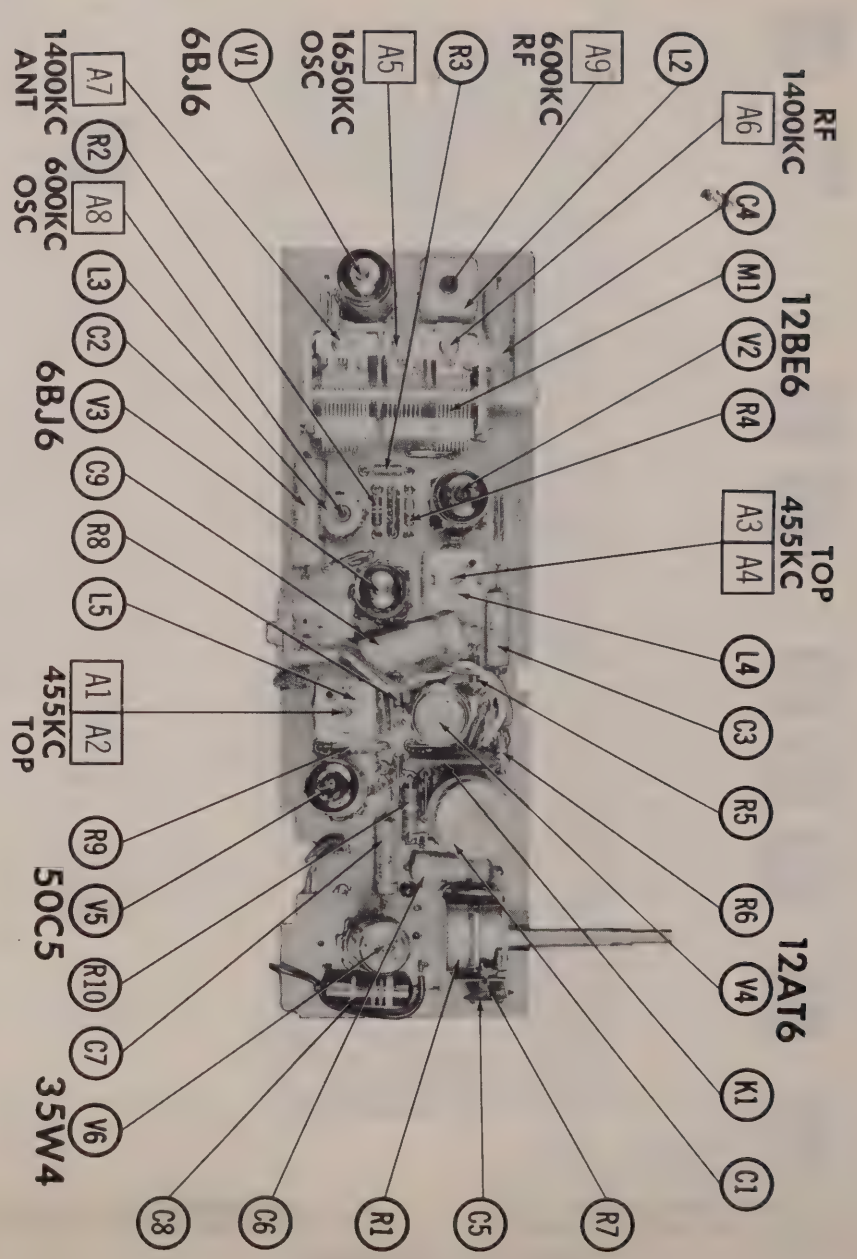
NAME	PART NO.	DESCRIPTION
Knob	740-0222	Tuning
Knob	740-0224	Volume
Knob	740-0223	Tone
Knob	740-0225	Dummy
Pushbuttons	751-0001	Sleep-Off-On-Radio Alarm, Models 2305RE, TU, YE
Dial	722-0070	Station, Models 1304RE, TU, YE
Dial	722-0071	Station, Models 2305RE, TU, YE
Pointer	792-0024	
Clock Crystal	717-0007	Models 2305RE, TU, YE
Cabinet Back	822-0029	Model 1304RE
Cabinet Back	822-0031	Model 1304TU
Cabinet Back	822-0033	Model 1304YE
Cabinet Back	822-0037	Model 2305RE
Cabinet Back	822-0038	Model 2305TU
Cabinet Back	822-0039	Model 2305YE
Cabinet Front	822-0035	Models 1304RE, TU, YE
Cabinet Front	822-0036	Models 2305RE, TU, YE

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—TOP VIEW



PHOTOFACT® Folder

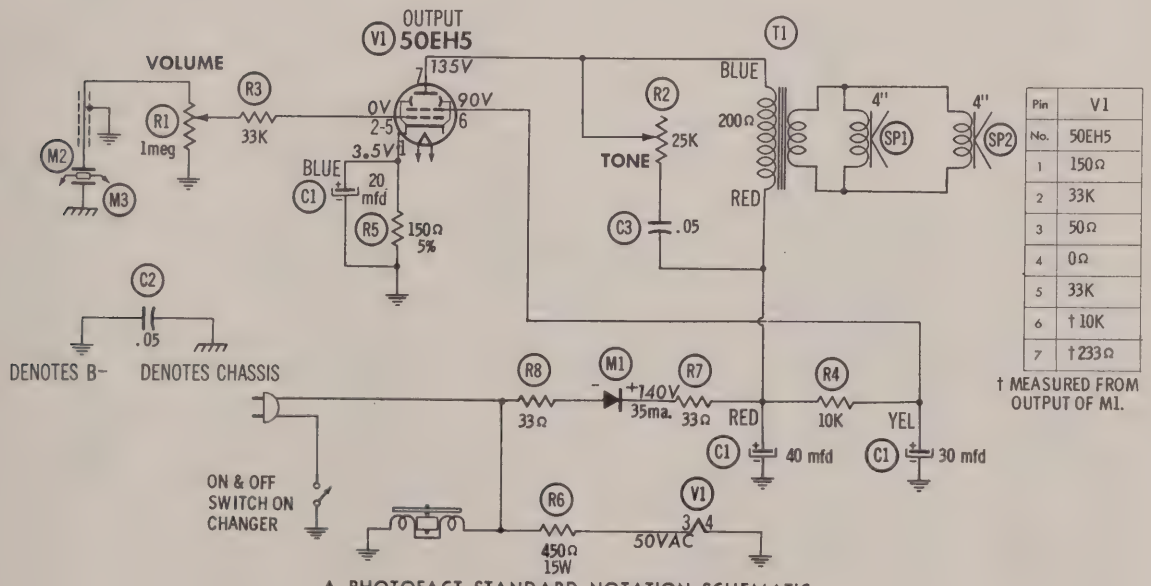
EIA

TRAV-LER MODEL 8080

TRAV-LER
MODEL 8080

TRADE NAME	Trav-Ler Model 8080
MANUFACTURER	Trav-Ler Radio Corp., 571 W. Jackson Blvd., Chicago 6, Illinois
TYPE SET	AC Operated One Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-125 Volts AC, 60 Cycles RATING 21 Watts, .23 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART # RC-29 — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11



Pin	V1
No.	50EH5
1	150Ω
2	33K
3	50Ω
4	0Ω
5	33K
6	†10K
7	†233Ω

† MEASURED FROM OUTPUT OF M1.

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SET 474 FOLDER 18

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Output	50EH5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	EC-71	PRS3625	BBRT43215	TCT3105	TDLT-3	TVA-3448	
B	30	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C3	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	VC-118	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	25K	½	VC-71	B-26	A47-25K-S	Q11-120	U29	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	33K	
R4	10K	

ITEM No.	RATING	REMARKS
R5	150Ω 5%	
R6	450Ω 15W	

ITEM No.	RATING	REMARKS
R7	33Ω	
R8	33Ω	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	1-2Ω	(Part of SP1)	24S48	A-3026			24S48	S-6X	

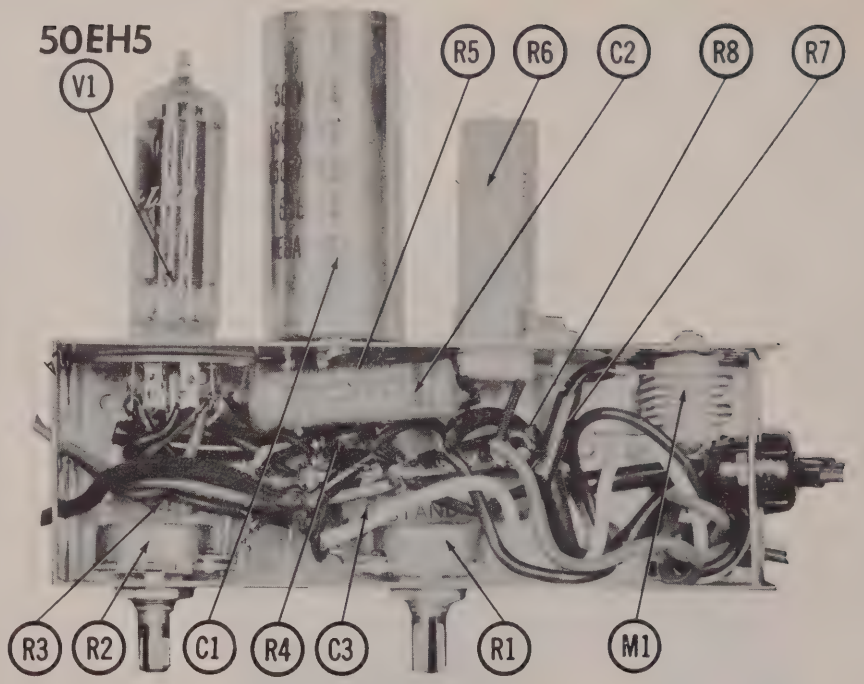
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	SPK-83 ①	4A1	① Includes T1
SP2	4"	PM	3-4Ω	SPK-38	4A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	TRAV-LER PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.036A	SR-3 ①	T065 ①	1234AH ①	65 ①	SR200 ②	① Selenium Type ② Silicon Type

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	TRAV-LER PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2		76TS-TB	Not Req.						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	TRAV-LER PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78 RPM)	W-64S † or W-64D ♦	CRA-55 † or CRA-55D ♦	† Jewel ♦ Diamond
	(LP)	W-64MGS † or W-64MGD ♦	CRA-55LP † or CRA-55LPD♦	

WIRING DATA

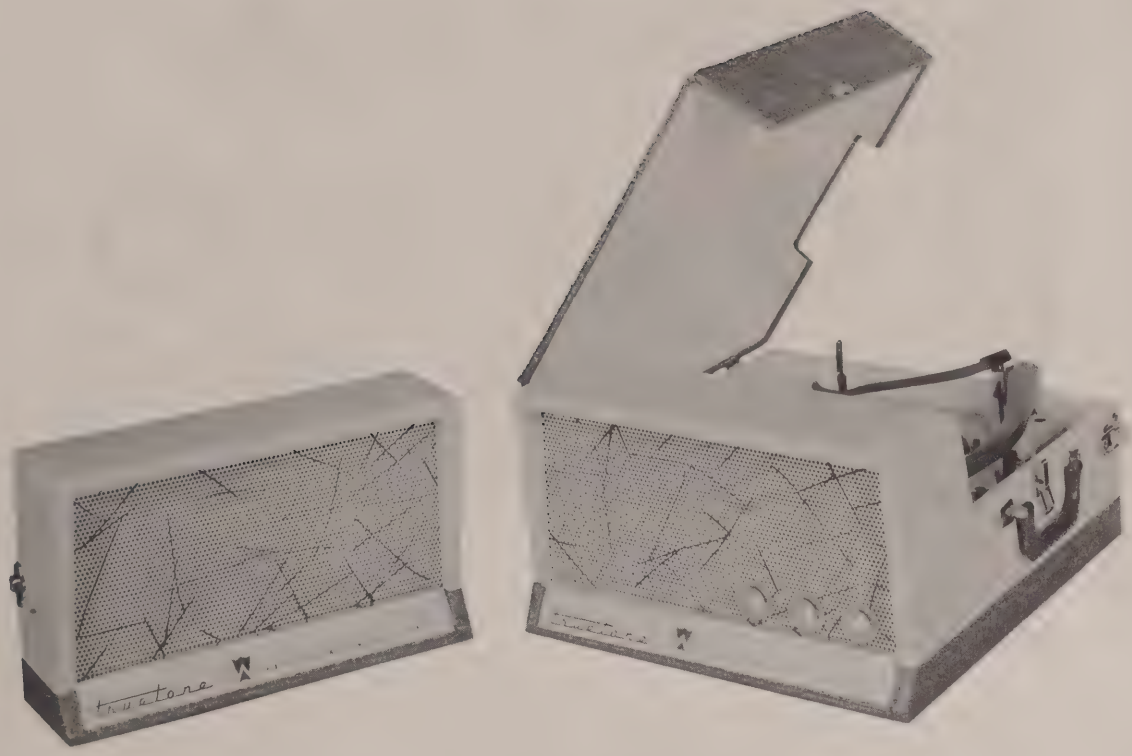
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

EIA MEMBER

TRUTONE
MODEL DC5983A

TRUTONE
MODEL DC5983A



TRUTONE
MODEL DC5983A

TRADE NAME	Truetone Model DC5983A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Missouri
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 32 Watts, .37 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #550-104 — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1 V2	Channel 1 AF Amp. Channel 1 Output	7025 (12AX7/ ECC83)* 50L6GT	V3 V4	Channel 2 AF Amp. Channel 2 Output	7025(12AX7/ ECC83) * 50L6GT

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	150	150-147	PRS3650	BBRT44215	WT217	TDLT-4	TVA-3448	
B	40	150							
C	20	150							
C2A	40	150	150-147	PRS3650	BBRT44215	WT217	TDLT-4	TVA-3448	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	20000	①	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C4	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C5	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C6	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C9	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C10	20000	①	BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C11	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C12	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C13	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C16	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C18	.05 200V	①	P288N-05	DF-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	120-153	B-76	AD47-2meg-Z	Q13-139		
B	2meg	½		SR-76	Not Req.	M13-139	■ UE1877	Loudness, Channel 2
C	Shaft			Not Req.	FS-3	Not Req.		Loudness, Channel 2
R2A	100K	½	120-154	B-41	AD47-100K-S	Q13-128		
B	100K	½		SR-41	Not Req.	M13-128	▲ UE4054	Tone, Channel 2 Tone, Channel 1
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	1meg	½	120-155B	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

■ "STA-LOC" equivalent: FA26A, RU26A, CS3500.
▲ "STA-LOC" equivalent: FA15A, RU15A, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

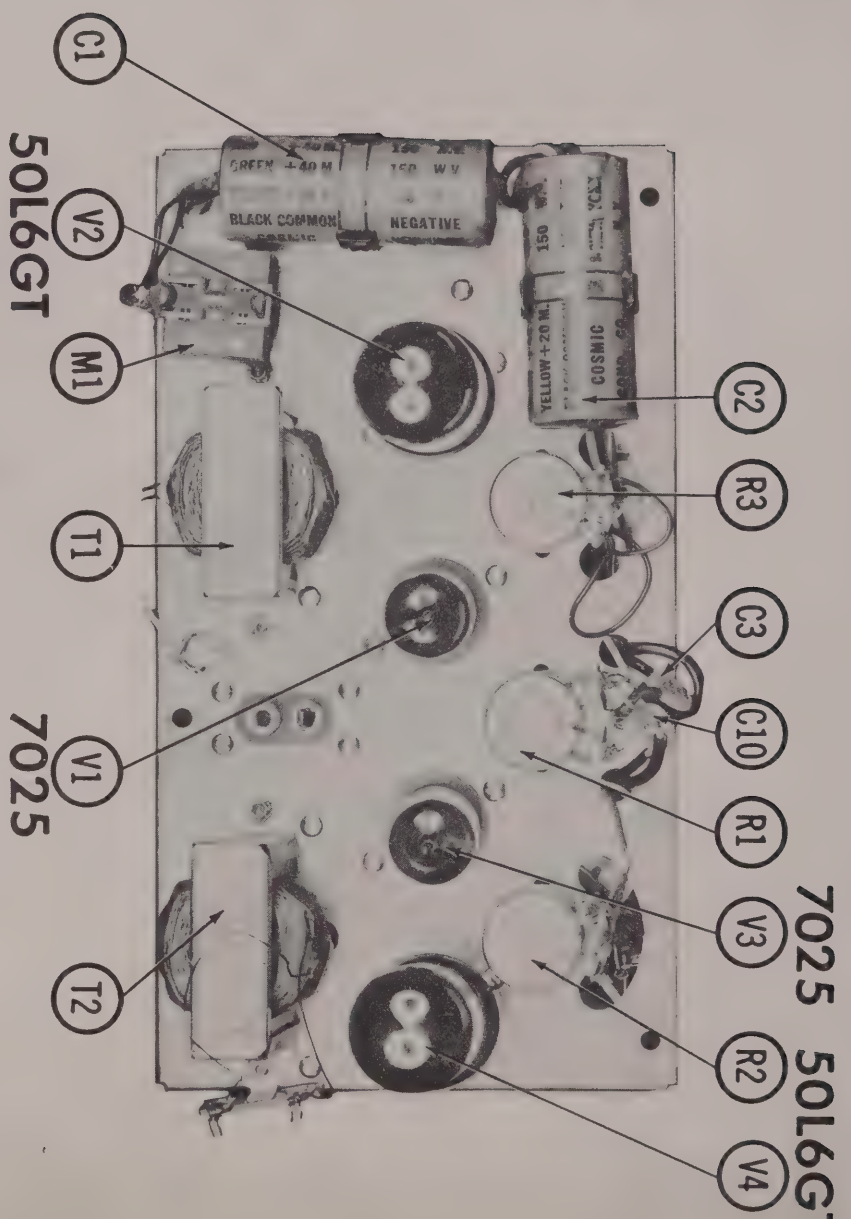
ITEM No.	RATING	REMARKS
R4	470K	Note 1
R5	330K	Note 1
R6	200K 5%	
R7	1000Ω	
R8	200K 5%	
R9	100K	
R10	200K 5%	
R11	680Ω 5%	
R12	470K	
R13	150Ω	

ITEM No.	RATING	REMARKS
R14	15K	
R15	4700Ω	
R16	470K	Note 1
R17	330K	Note 1
R18	200K 5%	
R19	1000Ω	
R20	200K 5%	
R21	100K	
R22	200K 5%	
R23	680Ω 5%	

ITEM No.	RATING	REMARKS
R24	470K	
R25	150Ω	
R26	15K	
R27	4700Ω	
R28	22K 5%	
R29	1000Ω	
R30	22K 5%	
R31	1000Ω	
R32	47Ω 1W	
R33	47Ω 2W	

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2600Ω Tap ⓐ 3%	3-4Ω SEC. 2 200Ω	138-141							
T2	2600Ω Tap ⓐ 3%	SEC. 1 3-4Ω SEC. 2 200Ω	138-141							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA TRUETONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6½"	PM	3-4Ω	175-141	6A21	
SP2	6½"	PM	3-4Ω	175-141	6A21	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA TRUETONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.073A	265-125 ①	5E4 ① RS150 ②	HA154 ① 1235AH ②	K200 ① 150 ②	SR200 ①	① Silicon ② Selenium

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	600-207	13T	Not Req.	66	Not Req.			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3		*W-101STS † or ♦W-102S † or *W-101STD ♦		† Jewel ♦ Diamond * Includes Cartridge

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Cabinet	500-122	

WIRING DATA

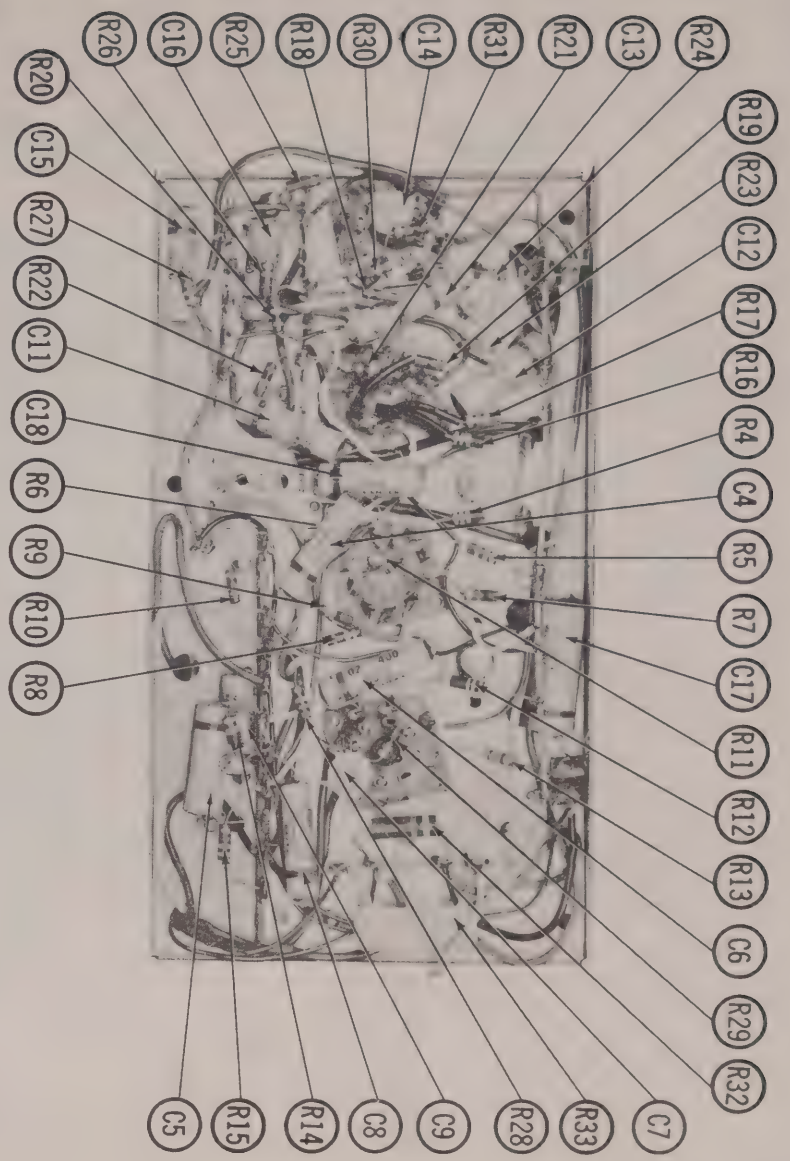
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

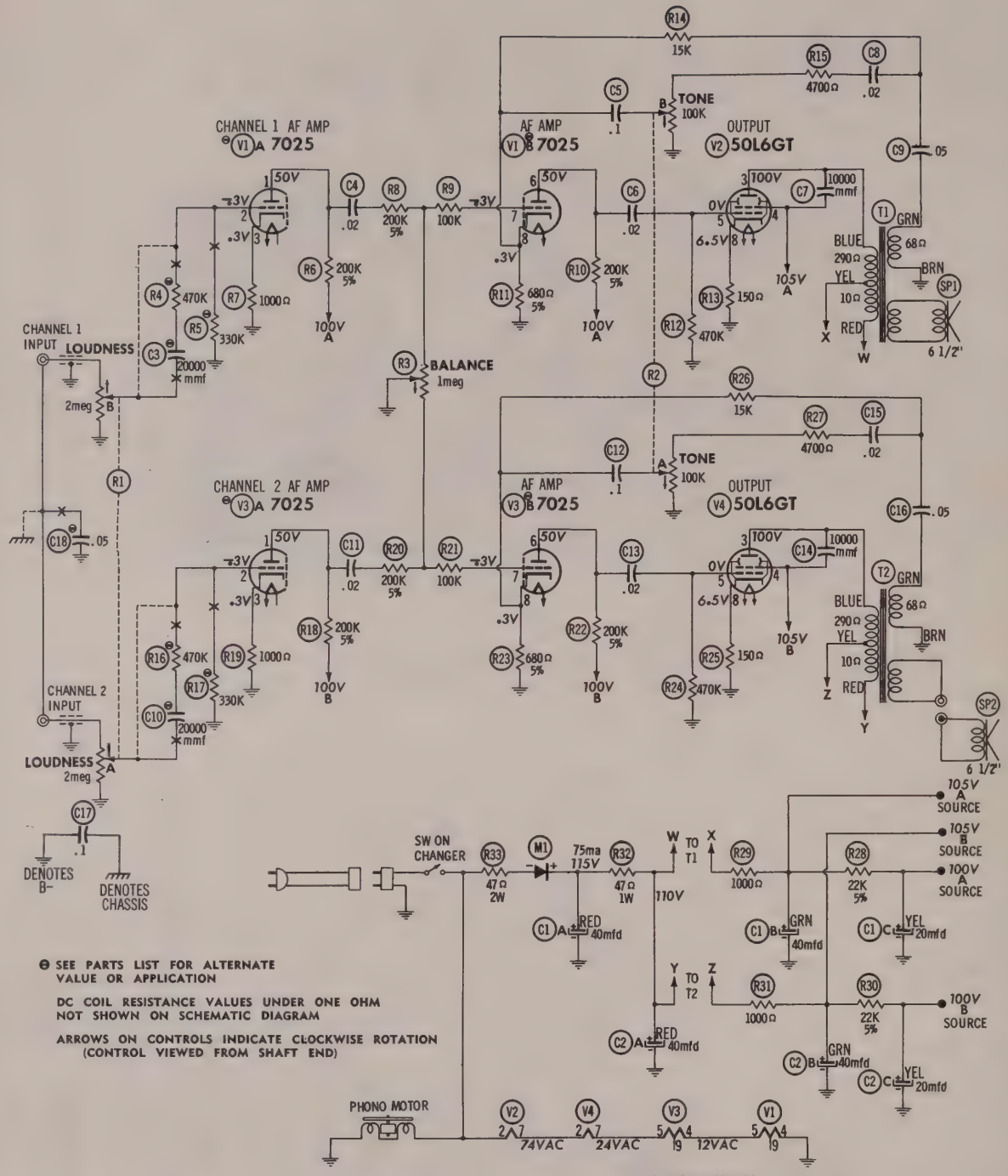
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS BOTTOM VIEW





⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	†225K	330K	1000Ω	0Ω	12Ω	†225K	750K	680Ω	6Ω
V2	50L6GT	NC	124Ω	†350Ω	†1000Ω	470K	TP	74Ω	150Ω	
V3	7025	†225K	330K	1000Ω	12Ω	24Ω	†225K	750K	680Ω	18Ω
V4	50L6GT	NC	74Ω	†350Ω	†1000Ω	470K	TP	24Ω	150Ω	

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TRUTONE
MODEL DC5983A

PHOTOFACT® Folder

WEBCOR MODELS 4901, 4903-1, -1A, 4904-1, -1A (Ch. 14X292-1, 296-1, 305-1)

WEBCOR MODELS 4901, 4903-1, -1A, 4904-1, -1A (Ch. 14X292-1, 296-1, 305-1)

MODEL MC4904-1

WEBCOR MODELS 4901, 4903-1, -1A, 4904-1, -1A (Ch. 14X292-1, 296-1, 305-1)

TRADE NAME	Webcor	Chassis	Models
		14X292-1.....	BT4901-1, MT4901-1, PT4901-1, WT4901-1
		14X296-1.....	BC4903-1, EC4903-1, EC4904-1, MC4903-1 MC4904-1, PC4904-1, WC4903-1, WC4904-1
		14X305-1.....	BC4903-1A, EC4903-1A, EC4904-1A, MC4903-1A MC4904-1A, PC4904-1A, WC4904-1A
MANUFACTURER	Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois		
TYPE SET	AC Operated 4 Tube Audio Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 65 Watts, .65 Amp. @117 Volts AC		

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JX421

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PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	AF Amp. -Phase Inv.	7025 (12AX7) *
V2	Output	6BQ5 Note 1

ITEM No.	USE	TYPE
V3	Output	6BQ5 Note 1
V4	Rectifier	5Y3GT

* Alternate
Note 1. 12AB5 Used in Chassis 14X292-1

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲35	375	30P306	AFH4-79	D0150	FP421.4	TMQ-16	TVL-4771	Note 1
B	■35	375			BBR25-25		TD-25-25	TVA-1205	
C	▲15	250							
D	25	25							

Note 1. Ch. 14X292-1 use 3 section unit of 40mfd@400V, 40mfd@350V, 40mfd@25V omitting C1C (Part #30P292).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C3	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	4mfd 25V		P1589ZXY-4					118P40502S2
C7	2mfd 25V		P289ZXY-2		WMF1W2E			118P20502S2
C8	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	2HV-110	BL-S10

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	31P146	B-51	A47-250K-Z	Q13-130	U44	Volume. Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On
D	Cover			KR-5				

Note 1. Ch. 14X292-1 use Part #31P144.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

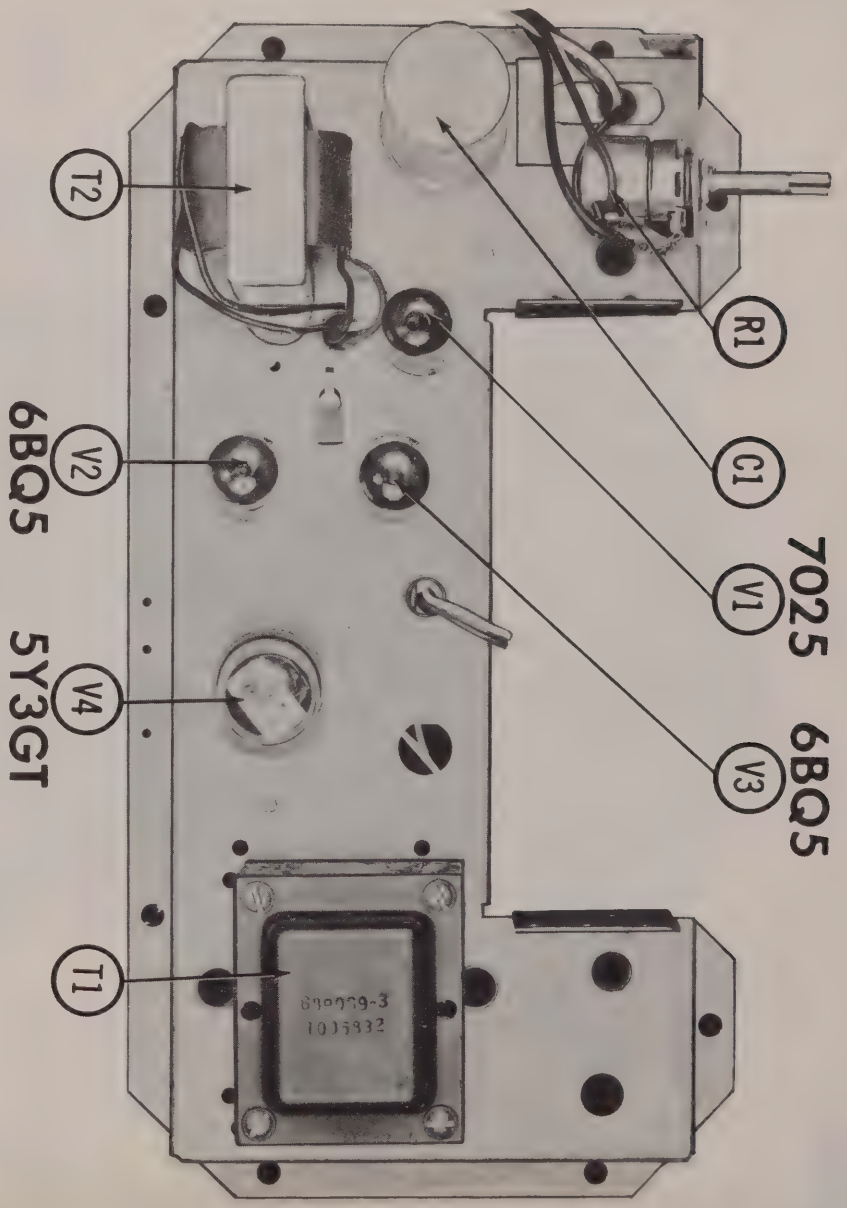
ITEM No.	RATING	REMARKS
R2	180K	
R3	2700Ω	
R4	470K	
R5	100K	

ITEM No.	RATING	REMARKS
R6	1000Ω	
R7	100K	
R8	150K	
R9	150K	

ITEM No.	RATING	REMARKS
R10	135Ω 5W	Note 1 #29P081
R11	47K	Note 2
R12	22K	Note 3
R13	2200Ω 1W	Note 4

Webcor Part Number.
Note 1. Ch. 14X292-1 uses 270Ω 2W in this application.
Note 2. Ch. 14X305-1 uses 82K in this application.
Note 3. Not used in Ch. 14X292-1.
Note 4. Ch. 14X292-1 uses 1000Ω 5W in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ① .65A	650 VCT ⓐ .080A	5V ⓐ 2A	68P069 ①	22R32 ②			P-8176 ②	22R32 ②	
	SEC. 3	SEC. 4	SEC. 5							
	12.6V ⓐ 1.1A									

① Ch. 14X292-1 uses Part #67P068.

② Connect in series and phase 6.3V windings. Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI. 1	SEC.	WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6200Ω CT	6-8Ω	67P059-1 ①							① Alternate Part # 67P070. Also used in Ch. 14X296-1. ② Used in Ch. 14X305-1. Ch. 14X292-1 use 67P067. ③ Drill New Mounting Holes.
	PRI. 2									
	10Ω CT Not Used									
	6000Ω CT	16Ω	67P069 ②	24S55	A-2904 ③	AU-609	A-3830	24S55	S-57Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	QUAM PART No.	
SP1	10"	PM	6-8Ω	76P087-1 ①②	10A1Z7.4 ①	① Parallel & Phase ② Models 4903, 4904 ③ Models 4901, 4903, 4904 ④ Models 4903-1A, 4904-1A ⑤ Model 4901
SP2	6"	PM	6-8Ω	76P082-1 ①③	6A1Z7.9 ①	
SP3	3½"	PM	6-8Ω	76P081-1 ①③	3A15T ①	
	10"	PM		76P087-2 ④		
	8"	PM		76P080 ⑤		
	6"	PM		76P082-2 ④		
	3½"	PM		76081-2 ④		

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

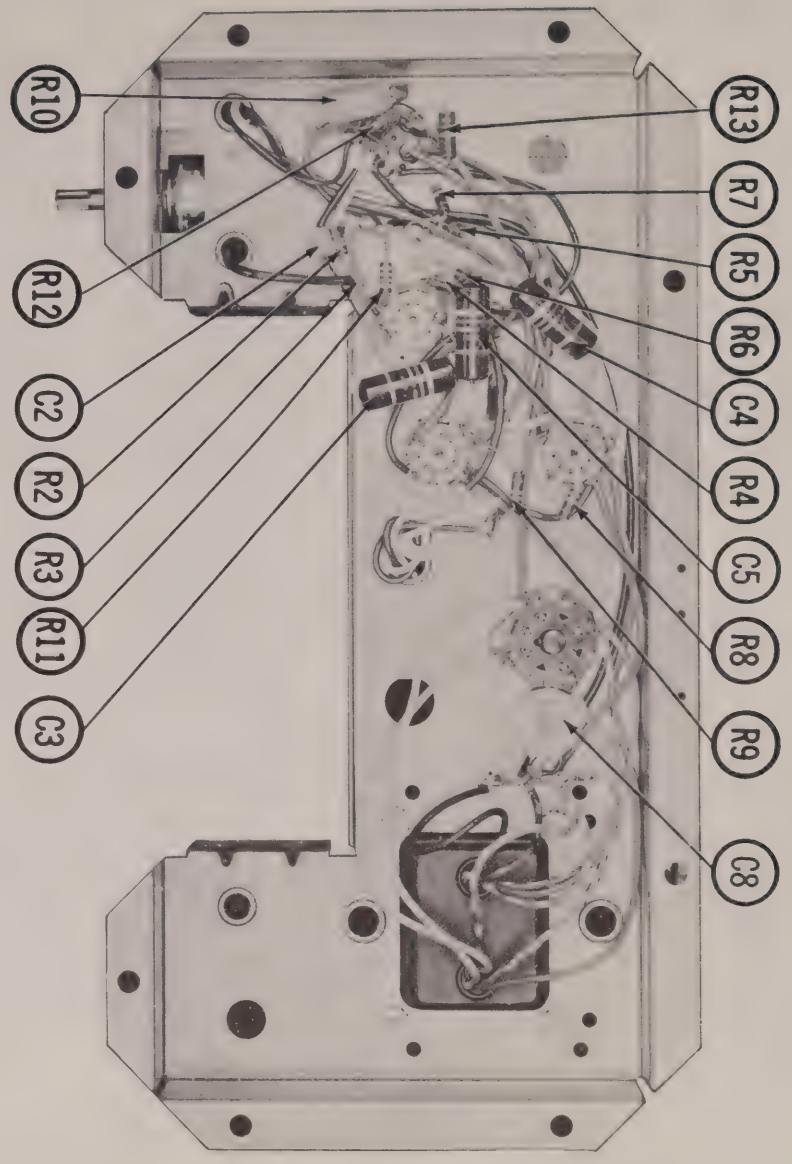
NAME	PART NO.	DESCRIPTION
Knob	39P148-10C	Volume, Models BC4903-1, -1A, MC4903-1, -1A, WC4903-1, -1A, MC4904-1, -1A, PC4904-1, -1A, & WC4904-1, -1A
Knob	39P148-10T	Volume, Models EC4903-1, -1A, & EC4904-1, -1A
Knob	39P213-1	Volume, Model 4901-1
Cabinet	92X091-1	Model MC4903-1, -1A
Cabinet	92X091-2	Model WC4903-1, -1A
Cabinet	92X091-3	Model BC4903-1, -1A
Cabinet	92X091-4	Model EC4903-1, -1A
Cabinet	92X092-1	Model WC4904-1, -1A
Cabinet	92X092-2	Model PC4904-1, -1A
Cabinet	92X092-3	Model MC4904-1, -1A
Cabinet	92X092-4	Model EC4904-1, -1A
Cabinet	92X090-1	Model MT4901-1
Cabinet	92X090-2	Model BT4901-1
Cabinet	92X090-3	Model WT4901-1
Cabinet	92X090-4	Model PT4901-1

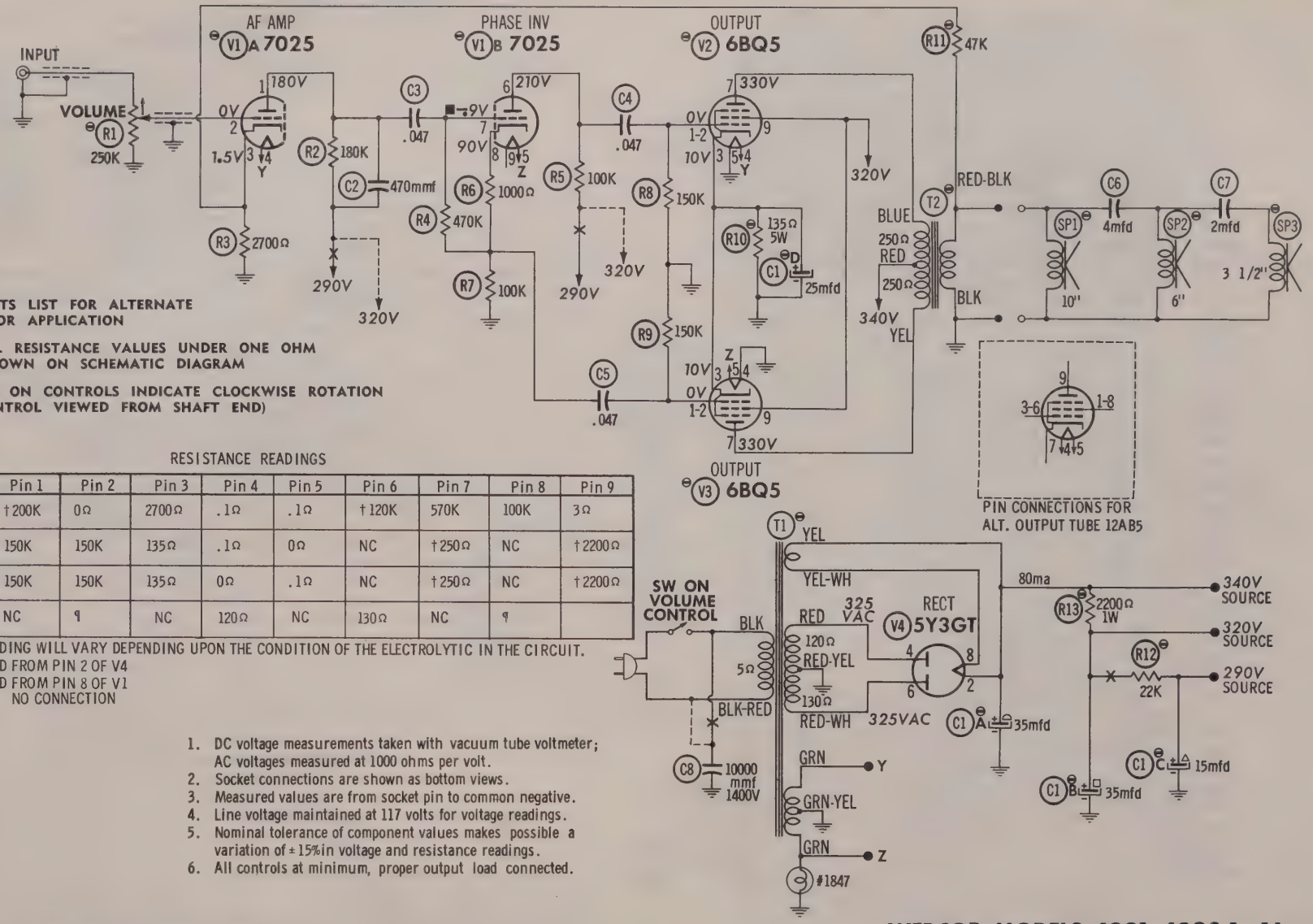
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS BOTTOM VIEW





⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	†200K	0Ω	2700Ω	.1Ω	.1Ω	†120K	570K	100K	3Ω
V2	6BQ5	150K	150K	135Ω	.1Ω	0Ω	NC	†250Ω	NC	†2200Ω
V3	6BQ5	150K	150K	135Ω	0Ω	.1Ω	NC	†250Ω	NC	†2200Ω
V4	5Y3GT	NC	¶	NC	120Ω	NC	130Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V4
■ MEASURED FROM PIN 8 OF V1
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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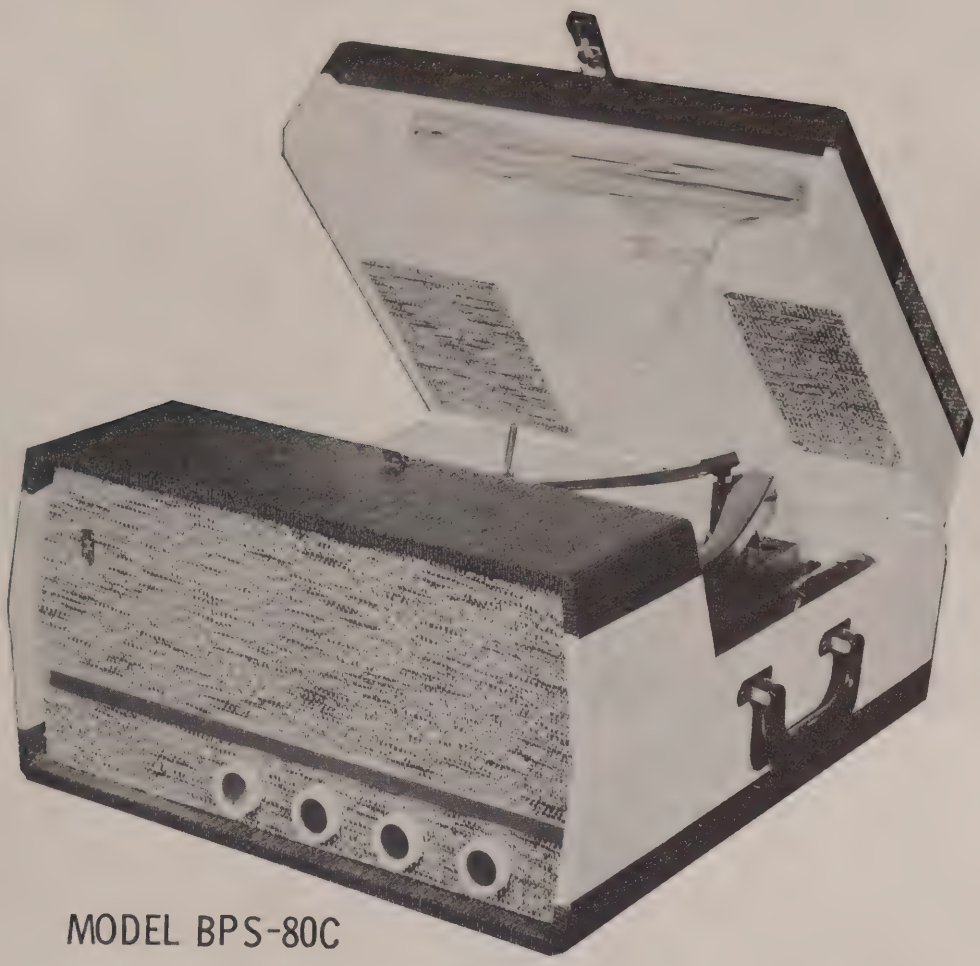
WEBCOR MODELS 4901, 4903-1, -1A, 4904-1, -1A (Ch. 14X292-1, 296-1, 305-1)

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ZENITH MODELS BPS-80C, DPS-80C

ZENITH MODELS
BPS-80C, DPS-80C



MODEL BPS-80C

ZENITH MODELS
BPS-80C, DPS-80C

TRADE NAME	Zenith Models BPS-80C, DPS-80C
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated 5 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 35 Watts, .375 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #169-111 — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18

BALANCE ADJUSTMENT (R4)

Connect a low range DC voltmeter across the Balance Control and adjust the control for minimum meter indication.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JT554

SET 474 FOLDER 21

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp.	6AU6A	V4	Right Channel Output	6AQ5A
V2	Left Channel Output	6AQ5A	V5	Rectifier	6X4
V3	Right Channel AF Amp.	6AU6A			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	350	WC13235	AFH4-50	D0560	FP421.4	TMQ-15	TVLS-4605.10*	
B	■15	350							
C	25	25							
D	▲25	25							
C2	4	10VNP	WC12961	PRS7405	BBR8-150 †	TCN504		TVAS-1150 *	
C3	4	10VNP	WC12961	PRS7405	BBR8-150 †	TCN504		TVAS-1150 *	

† Use printed circuit adaptor #55277 and 55278.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C5	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C6	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C10	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C12	.01 400V	Note 1	P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5meg	½	WC13229	B-88			■ UE3967	Loudness, Right Channel
B	5meg	½		SR-88				Loudness, Left Channel
R2A	5meg	½	WC13229	B-88			■ UE3967	Bass, Right Channel
B	5meg	½		SR-88				Bass, Left Channel
R3A	2meg	½	WC13228	B-76	AD47-2meg-Z	Q13-139		Treble, Right Channel
B	2meg	½		SR-76	Not Req.	M13-139	▲ UE1877	Treble, Left Channel
C	Shaft			Not Req.	KSS-3	Not Req.		
R4A	1meg	½	WC13501	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	KSS-3	Not Req.		

■ "STA-LOC" equivalent: FB56A, RU56A, CS3500.
▲ "STA-LOC" equivalent: FA26A, RU26A, CS3500

RESISTORS

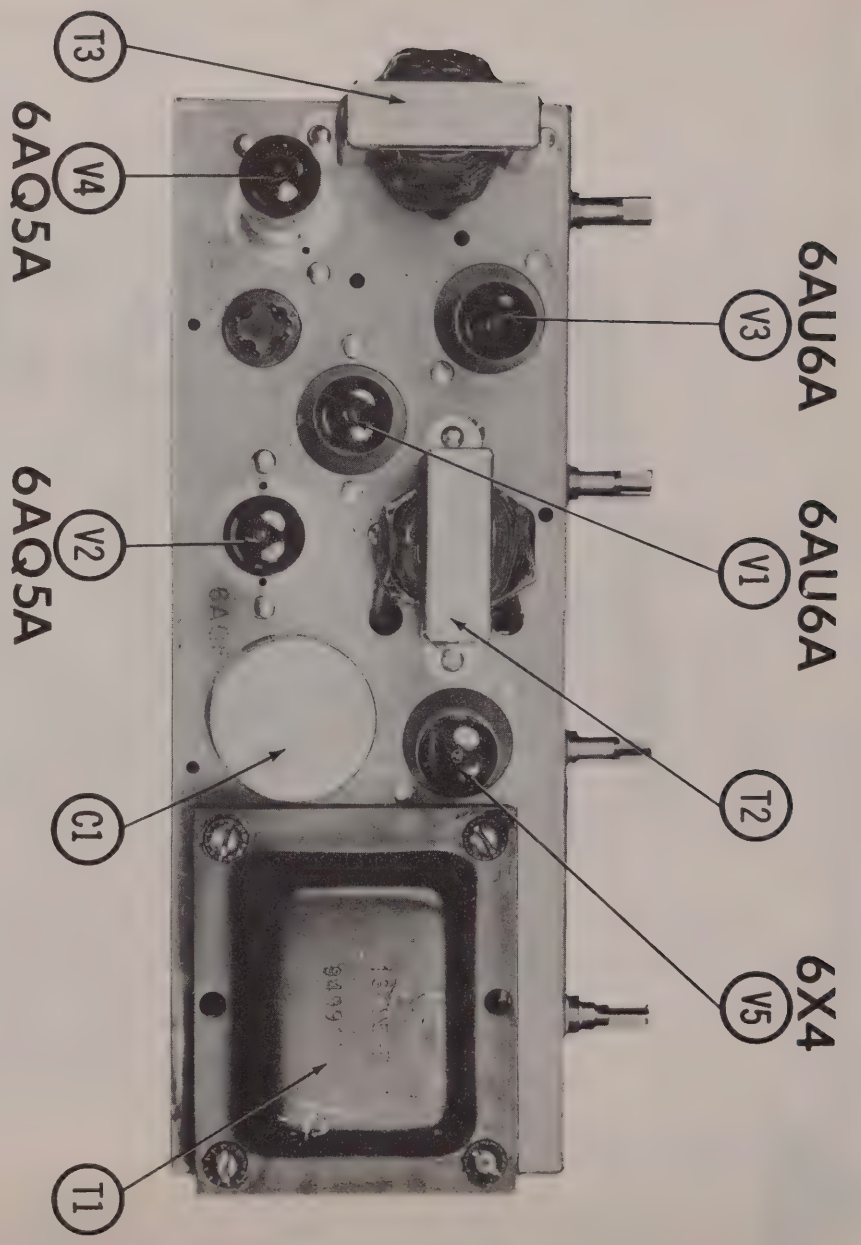
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	3.9meg	
R6	270K	
R7	10meg	
R8	270K	
R9	560Ω	
R10	18K	
R11	10K	

ITEM No.	RATING	REMARKS
R12	1meg	
R13	330Ω 1W	
R14	270K	
R15	10meg	
R16	270K	
R17	100K	
R18	27K	

ITEM No.	RATING	REMARKS
R19	560Ω	
R20	18K	
R21	10K	
R22	1meg	
R23	330Ω 1W	
R24	10K 1W	
R25	100Ω 1W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .375A	540 VCT @.050A	6.3 VCT @2.2A	WC13485	24R21			PM8404	24R21	R-9B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	3-4Ω	WC13342	24S51	A-2930	AU-601	A-3877	24S51	S-3X	
T3	5200Ω	3-4Ω	WC13342	24S51	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	5"x 7"	PM	6-8Ω	WC13511	57A1Z6	
SP2	3½"	PM	6-8Ω	WC12908	3A15T	
SP3	5"x 7"	PM	6-8Ω	WC13511	57A1Z6	
SP4	3½"	PM	6-8Ω	WC12908	3A15T	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	ZENITH PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	142-92	13TB	Not Req.	26-S	Not Req.			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ZENITH PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	56-400 †	W-101STS † or W-101STD ♦	E98 † or E98D ♦	† Jewel ♦ Diamond
	56-399 †	W-102MGS † or W-102MGD ♦	E98X † or E98XD ♦	

CABINETS & CABINET PARTS

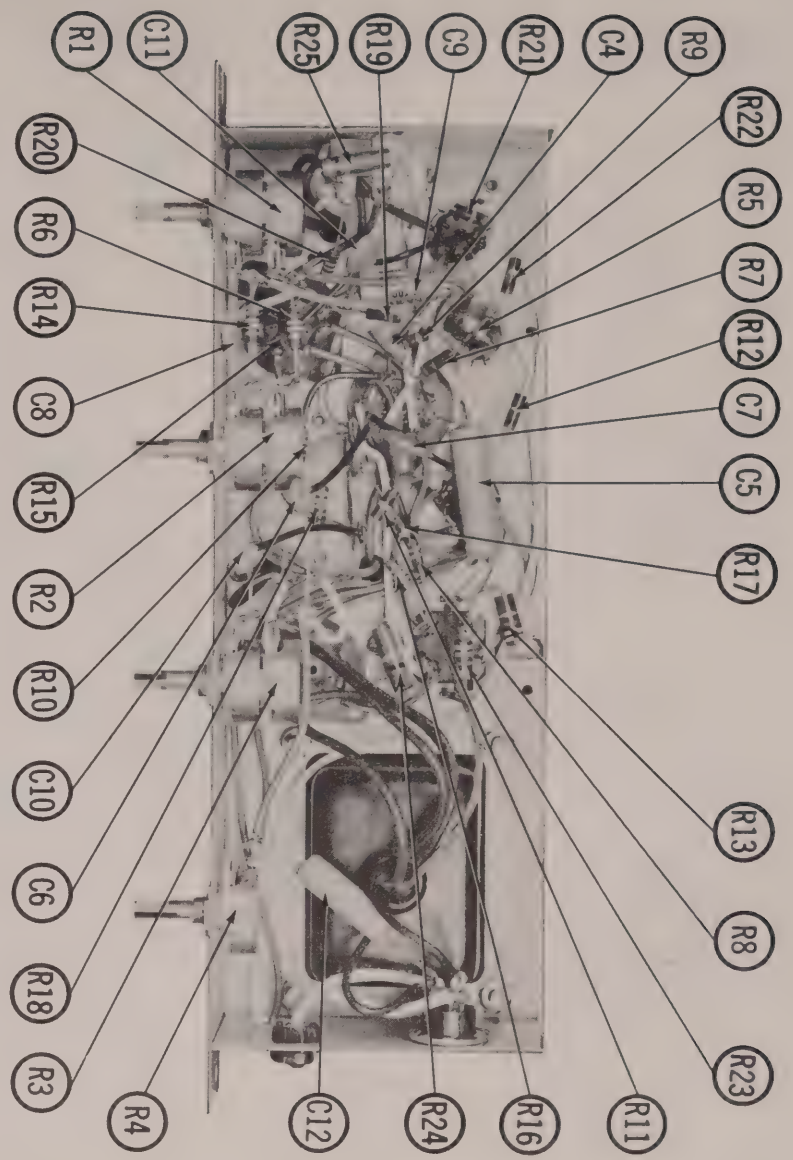
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

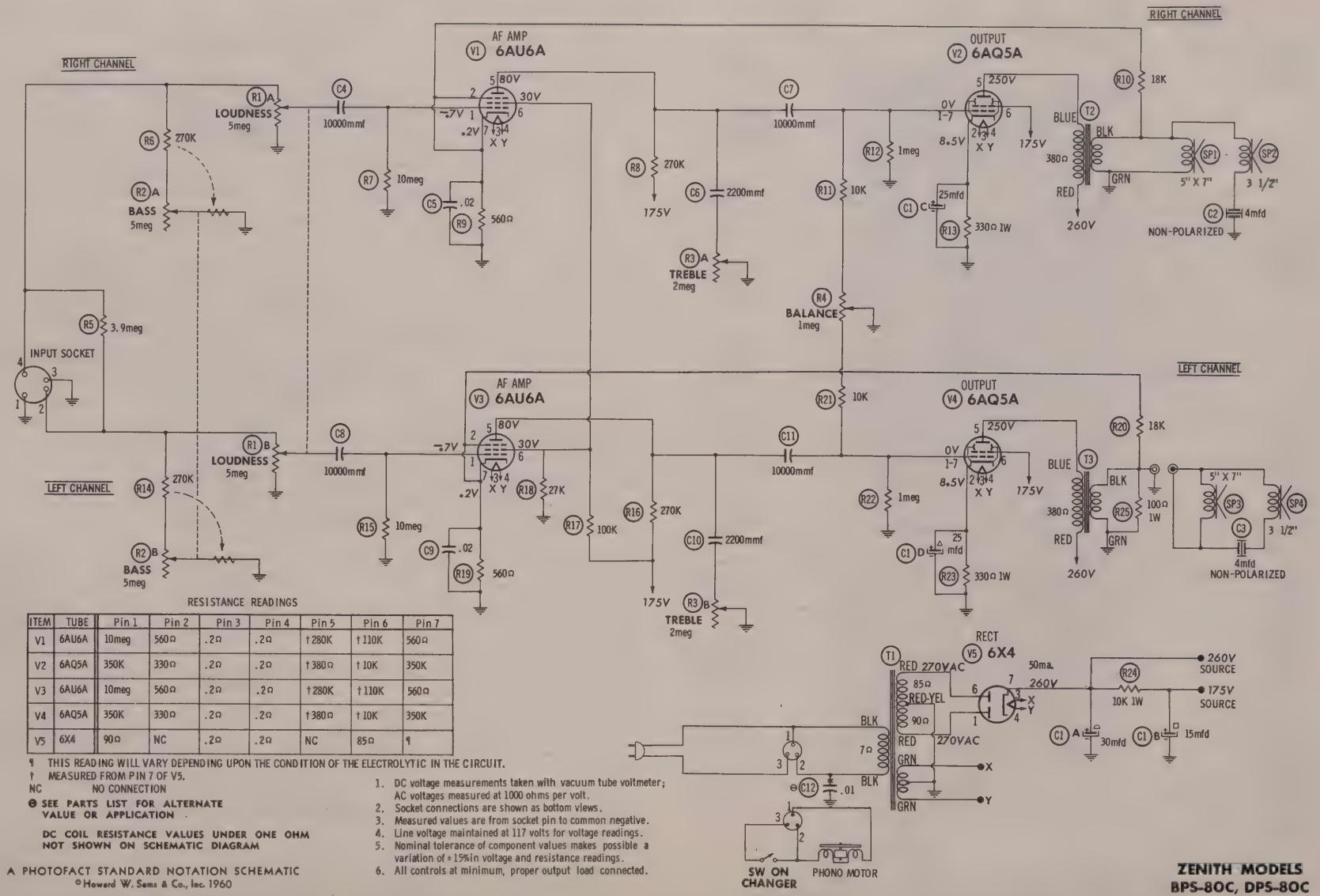
NAME	PART NO.	DESCRIPTION
Knob	WC13132-KA	Volume, Bass, Treble
Knob	WC13132-KB	Balance
Case	WC13558	Case With Hardware & Motor Board, Model BPS-80C
Case	WC13714	Case With Hardware & Motor Board, Model DPS-80C
Handle Ass'y.	WC13445-9B	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6AU6A	10meg	560Ω	.2Ω	.2Ω	†280K	†110K	560Ω
V2	6AQ5A	350K	330Ω	.2Ω	.2Ω	†380Ω	†10K	350K
V3	6AU6A	10meg	560Ω	.2Ω	.2Ω	†280K	†110K	560Ω
V4	6AQ5A	350K	330Ω	.2Ω	.2Ω	†380Ω	†10K	350K
V5	6X4	90Ω	NC	.2Ω	.2Ω	NC	85Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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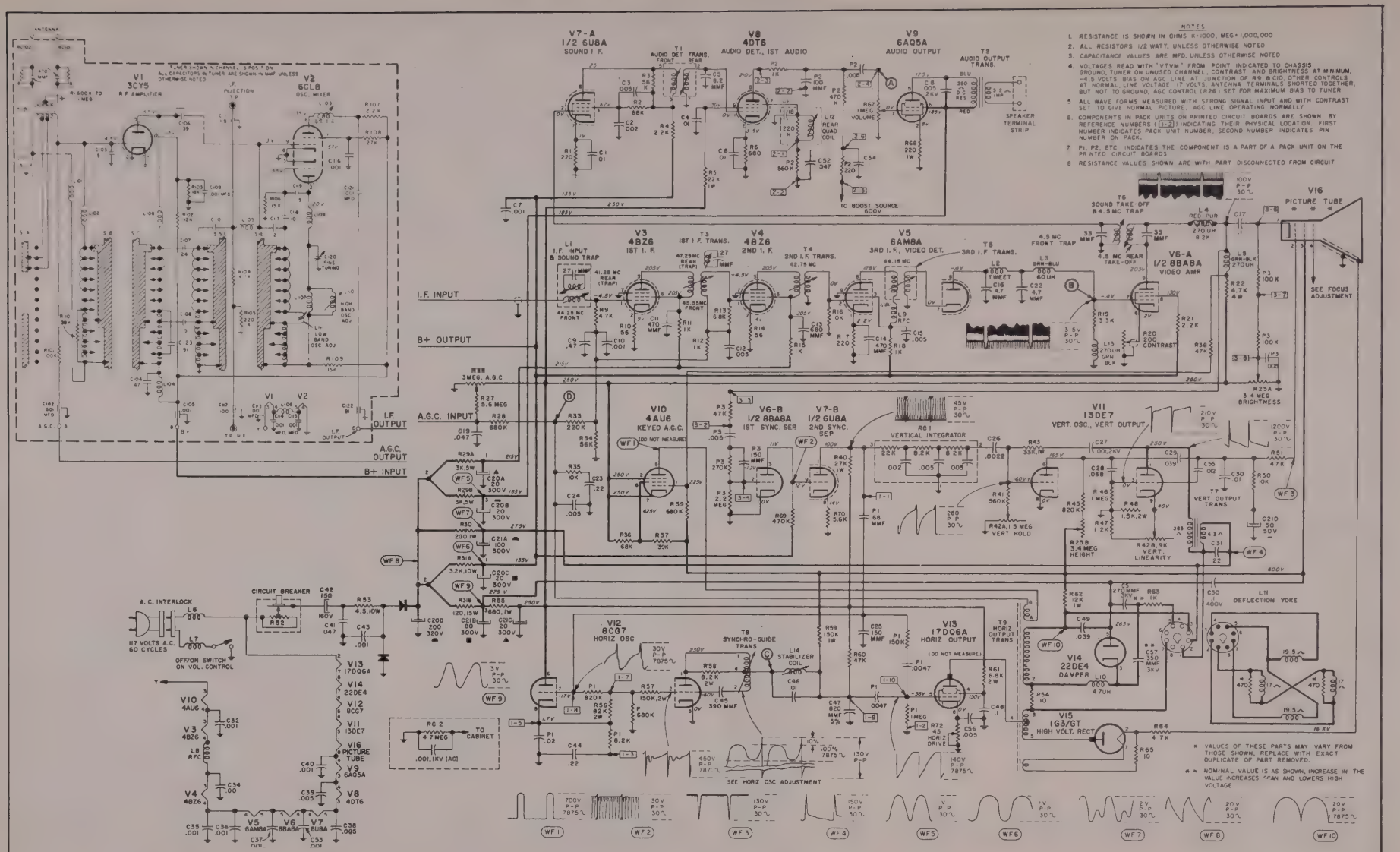
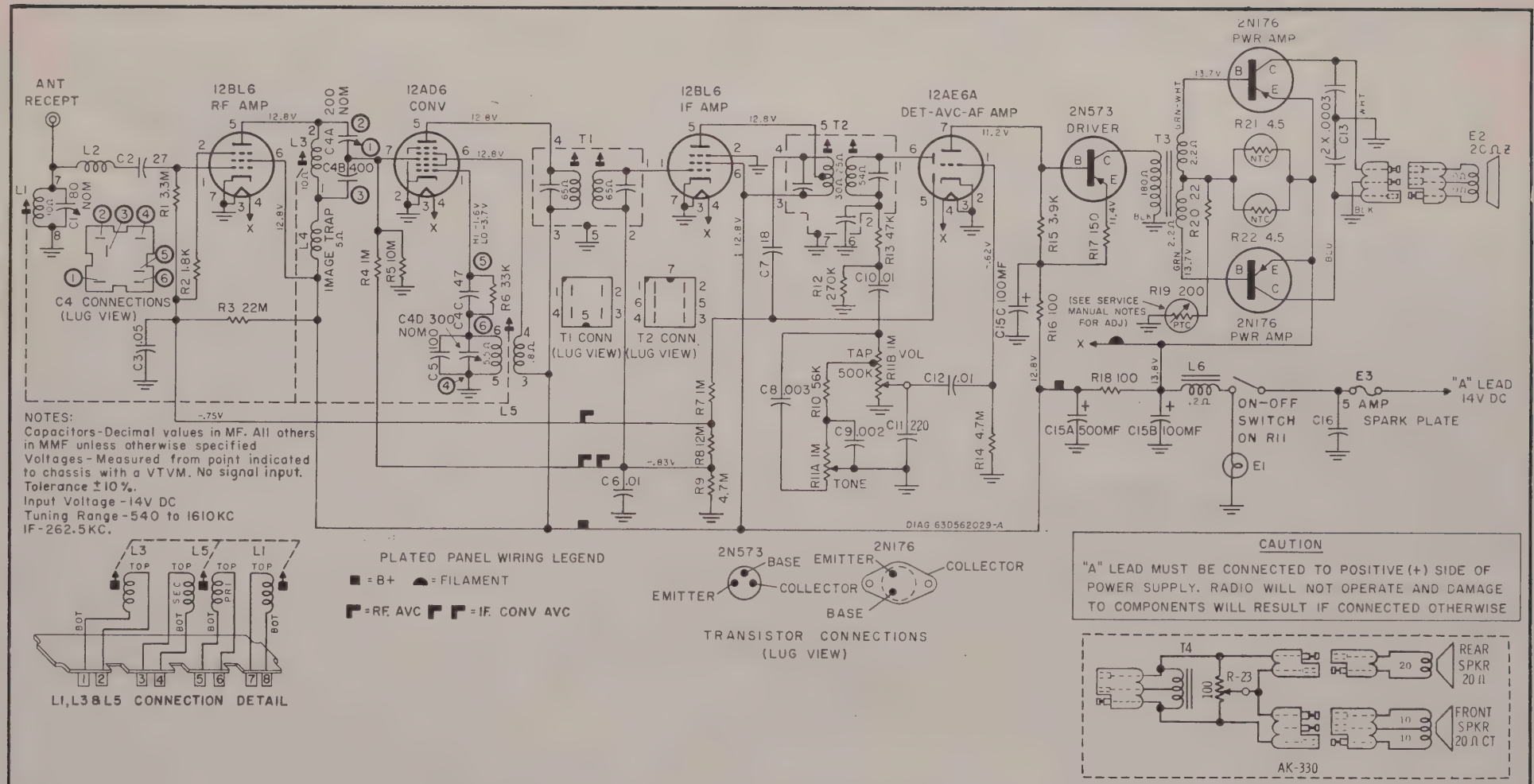
ZENITH MODELS BPS-80C, DPS-80C


NOTES
1. RESISTANCE IS SHOWN IN OHMS K=1000, MEG=1,000,000
2. ALL RESISTORS 1/2 WATT, UNLESS OTHERWISE NOTED
3. CAPACITANCE VALUES ARE MFD, UNLESS OTHERWISE NOTED
4. VOLTAGES READ WITH "VTVM" FROM POINT INDICATED TO CHASSIS GROUND, TUNER ON UNUSED CHANNEL, CONTRAST AND BRIGHTNESS AT MINIMUM, -4.5 VOLTS BIAS ON AGC LINE AT JUNCTION OF R9 & C10, OTHER CONTROLS AT NORMAL, LINE VOLTAGE 117 VOLTS, ANTENNA TERMINALS SHORTED TOGETHER, BUT NOT TO GROUND, AGC CONTROL (R28) SET FOR MAXIMUM BIAS TO TUNER
5. ALL WAVE FORMS MEASURED WITH STRONG SIGNAL INPUT AND WITH CONTRAST SET TO GIVE NORMAL PICTURE, AGC LINE OPERATING NORMALLY
6. COMPONENTS IN PACK UNITS ON PRINTED CIRCUIT BOARDS ARE SHOWN BY REFERENCE NUMBERS (1-2) INDICATING THEIR PHYSICAL LOCATION. FIRST NUMBER INDICATES PACK UNIT NUMBER, SECOND NUMBER INDICATES PIN NUMBER ON PACK.
7. P1, P2, ETC. INDICATES THE COMPONENT IS A PART OF A PACK UNIT ON THE PRINTED CIRCUIT BOARDS
8. RESISTANCE VALUES SHOWN ARE WITH PART DISCONNECTED FROM CIRCUIT
V1 3CY5 RF AMPLIFIER
V2 6CL8 OSC. MIXER
V3 4BZ6 1ST I. F.
V4 4BZ6 2ND I. F.
V5 6AM8A 3RD I. F., VIDEO DET.
V6-A 1/2 8BA8A VIDEO AMP.
V6-B 1/2 8BA8A 1ST SYNC. SEP.
V7-A 1/2 6U8A SOUND I. F.
V7-B 1/2 6U8A 2ND SYNC. SEP.
V8 4DT6 AUDIO DET., 1ST AUDIO
V9 6AQ5A AUDIO OUTPUT
V10 4AU6 KEYED A.G.C.
V11 13DE7 VERT. OSC., VERT OUTPUT
V12 8CG7 HORIZ OSC
V13 17DQ6A HORIZ OUTPUT
V14 22DE4 DAMPER
V15 1G3/GT HIGH VOLT. RECT.
V16 PICTURE TUBE
I.F. INPUT
B+ OUTPUT
A.G.C. INPUT
A.G.C. OUTPUT
B+ INPUT
I.F. OUTPUT
SEE FOCUS ADJUSTMENT
SEE HORIZ OSC ADJUSTMENT
TO BOOST SOURCE 600V
SPEAKER TERMINAL STRIP
A. C. INTERLOCK
CIRCUIT BREAKER
117 VOLTS A.C. 60 CYCLES
OFF/ON SWITCH ON VOL. CONTROL
TO CABINET
* VALUES OF THESE PARTS MAY VARY FROM THOSE SHOWN, REPLACE WITH EXACT DUPLICATE OF PART REMOVED.
** NOMINAL VALUE IS AS SHOWN, INCREASE IN THE VALUE INCREASES SCAN AND LOWERS HIGH VOLTAGE

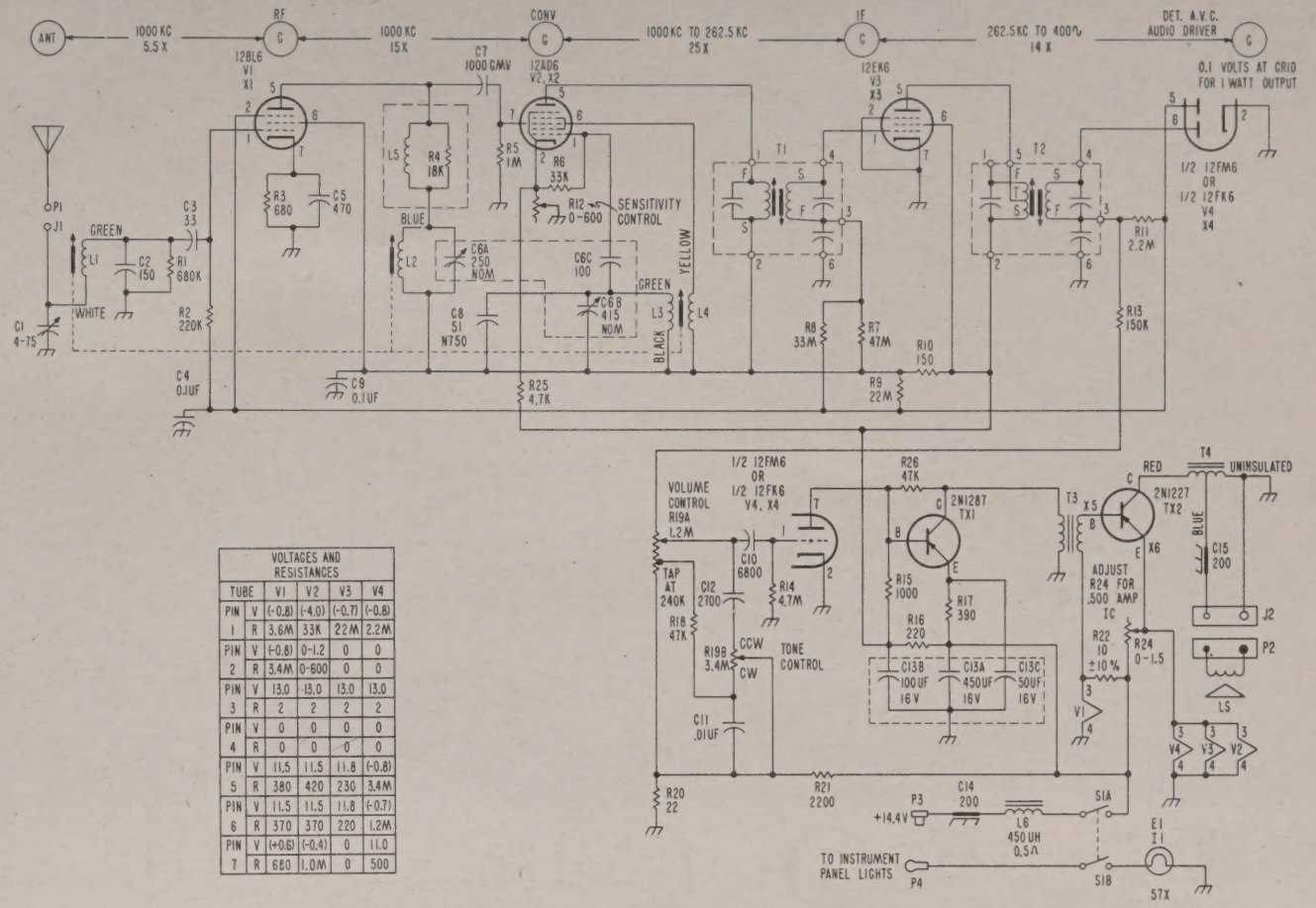
SILVERTONE MODELS PC-106AQ, PC-106-5AQ, PC-106DS, PC-106-5DS, PC-106GY, PC-106-5GY, 106AQ, 106-5AQ, 106DS, 106-5DS, 106GY, 106-5GY (CH. 456.51660, 456.51661, 528.51660, 528.51661)

Schematic Diagram Courtesy of Sears, Roebuck & Company



AMERICAN MOTORS MODEL 04MA (8990706)

Schematic Diagram Courtesy of Motorola Inc.



	TX1	TX2
BASE V	+11.0	+12.7
EMITTER V	+11.2	+13.0
COLLECTOR V	+1.6	+0.8

VOLTAGES AND RESISTANCES					
TUBE		V1	V2	V3	V4
PIN 1	V	(-0.8)	(-4.0)	(-0.7)	(-0.8)
	R	3.6M	33K	22M	2.2M
PIN 2	V	(-0.8)	0-1.2	0	0
	R	3.4M	0-600	0	0
PIN 3	V	13.0	13.0	13.0	13.0
	R	2	2	2	2
PIN 4	V	0	0	0	0
	R	0	0	0	0
PIN 5	V	11.5	11.5	11.8	(-0.8)
	R	380	420	230	3.4M
PIN 6	V	11.5	11.5	11.8	(-0.7)
	R	370	370	220	1.2M
PIN 7	V	(+0.6)	(-0.4)	0	11.0
	R	680	1.0M	0	500

NOTES:

ALL RESISTANCE IN OHMS. 1/2 WATT AND ±20% TOLERANCE UNLESS OTHERWISE STATED. K=1000, M=MEGOHM.

ALL CAPACITANCE IN MICROMICROFARADS. 100 VOLTS MIN. AND ±20% TOLERANCE UNLESS OTHERWISE STATED.

TUNING RANGE FROM 540KC TO 1600KC

I.F. FREQUENCY 262.5 KC.

VOLTAGE MEASUREMENTS:

1. VOLTAGES IN PARENTHESIS ARE MEASURED WITH VTVM.
2. ALL OTHER DC VOLTAGES MEASURED WITH A 20,000 OHMS/VOLT METER.
3. ALL AC VOLTAGES MEASURED WITH 1000 OHMS/VOLT METER.
4. ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS.
5. ALL VOLTAGES MEASURED WITH +14.4 VOLTS INPUT WITH NEGATIVE GROUND.

RESISTANCE MEASUREMENTS:

1. BATTERY DISCONNECTED.
2. NEGATIVE OHMMETER LEAD TO CHASSIS GROUND.
3. TONE SWITCH AND VOLUME CONTROL IN FULL CLOCKWISE POSITION.
4. VALUES SHOULD NOT VARY MORE THAN ±20%.

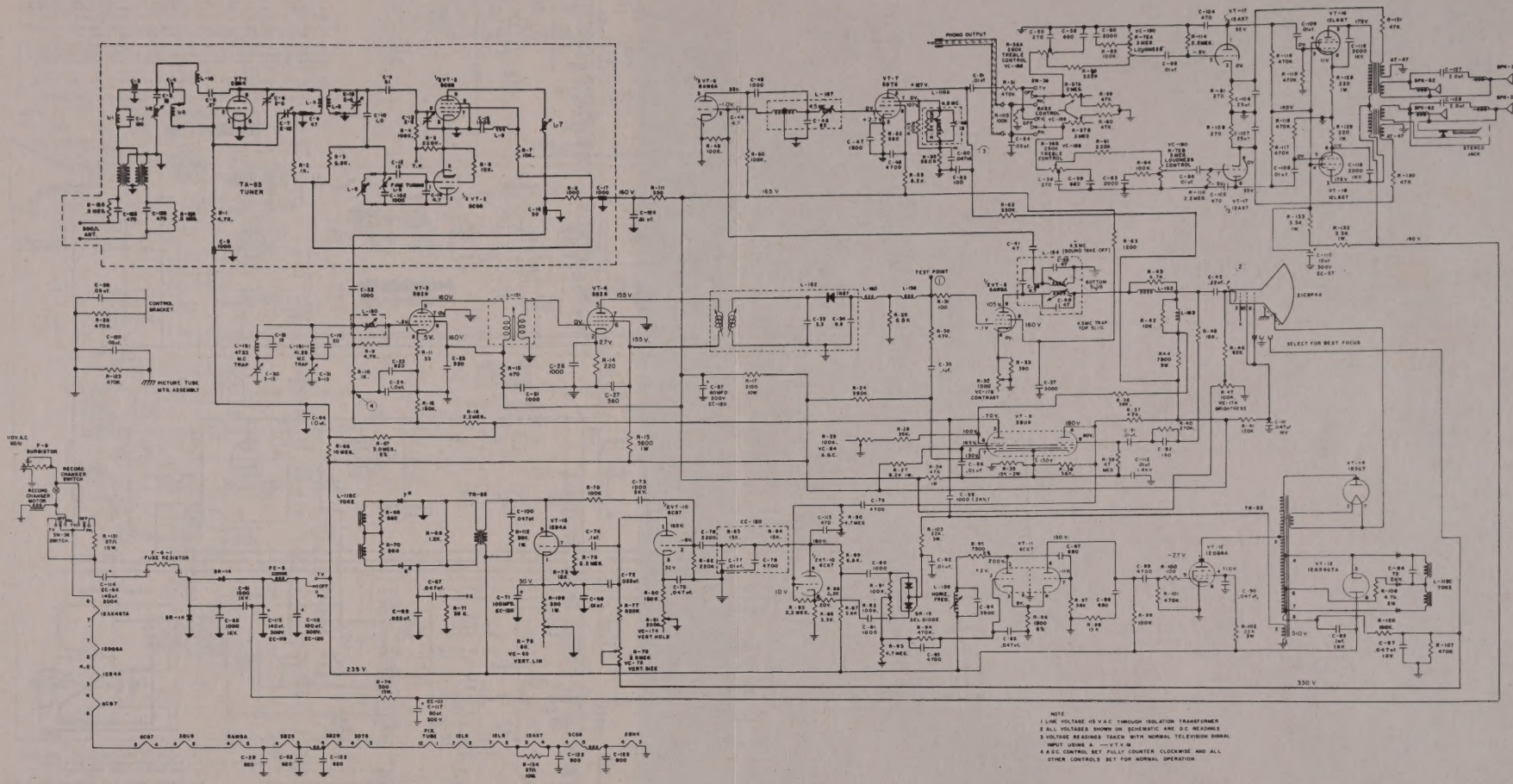
DUMMY ANTENNA

300UUF SERIES AND 300UUF SHUNT AT ANTENNA SOCKET. .01UF SERIES TO CONTROL GRIDS FOR GAIN MEASUREMENTS.

FORD MODEL 04BF

(COAF-18806, COAZ-18805)

Schematic Diagram Courtesy of Bendix Radio, Division of Bendix Aviation Corp.



TRAV-LER MODEL 921SP925B, M, W (CH. 1053-69)

Schematic Diagram Courtesy of Trav-Ler Radio Corporation

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